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ENERGY AND WATER DEVELOPMENT APPROPRIATIONS FOR 1987

HEARINGS

BEFORE A

SUBCOMMITTEE OF THE

COMMITTEE ON APPROPRIATIONS

HOUSE OF REPRESENTATIVES

NINETY-NINTH CONGRESS

SECOND SESSION

SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

TOM BEVILL, Alabama, *Chairman*

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BILL CHAPPELL, JR., Florida
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WES WATKINS, Oklahoma
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VIRGINIA SMITH, Nebraska
ELDON RUDD, Arizona

HUNTER L. SPILLAN, GEORGE A. URIAN, DONALD P. SMITH, and AARON D. EDMONDSON, *Staff Assistants*

PART 7

TESTIMONY OF MEMBERS OF CONGRESS AND OTHER INTERESTED INDIVIDUALS AND ORGANIZATIONS

Printed for the use of the Committee on Appropriations

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ENERGY AND WATER DEVELOPMENT APPROPRIATIONS FOR 1987

WEDNESDAY, APRIL 9, 1986.

TESTIMONY OF MEMBERS OF CONGRESS AND OTHER INTERESTED INDIVIDUALS AND ORGANIZATIONS

TEXAS PROJECTS

WITNESSES

HON. JACK BROOKS, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF TEXAS
MAYOR JOSEPH F. MOLLOY, CITY OF DICKINSON
COUNCILWOMAN PHYLLIS LEE, CITY OF FRIENDWOOD
MAYOR JOE L. LAMB, CITY OF LEAGUE CITY
MAYOR PRO TEM ED POOLE, CITY OF LEAGUE CITY
CITY ADMINISTRATOR PAUL NUTTING, CITY OF LEAGUE CITY
COUNCILMAN CHESTER DAVIS, CITY OF LEAGUE CITY
COUNCILMAN JEFF MALLIOS, CITY OF LEAGUE CITY
CITY MANAGER HOWARD McDANIEL, CITY OF NEDERLAND
COUNCILMAN MIKE BOURQUE, CITY OF NEDERLAND
JUDGE RAY HOLBROOK, COUNTY OF GALVESTON
COMMISSIONER FRANK CARMONA, COUNTY OF GALVESTON
COMMISSIONER RON CROWDER, COUNTY OF GALVESTON
COMMISSIONER EARL LLEWELLYN, COUNTY OF GALVESTON
COMMISSIONER BILLY JACK PEGUES, COUNTY OF GALVESTON
WAYNE SMITH, CONSULTING ENGINEER, WAYNE SMITH AND ASSOCIATES
JUDGE RICHARD P. LEBLANC, JR., COUNTY OF JEFFERSON
VICE PRESIDENT A. FRANK FRANKOVICH, CLEAR CREEK DRAINAGE DISTRICT
COMMISSIONER MARCUS JUNEMANN, GALVESTON COUNTY DRAINAGE DISTRICT #2
CHAIRMAN LEROY McCALL, JEFFERSON COUNTY DRAINAGE DISTRICT #3
PRESIDENT SAM O. SMITH, JEFFERSON COUNTY DRAINAGE DISTRICT #6
VICE PRESIDENT ROBERT C. HORN, JEFFERSON COUNTY DRAINAGE DISTRICT #6
COMMISSIONER JOSH ALLEN, JEFFERSON COUNTY DRAINAGE DISTRICT #6
COMMISSIONER PAT HENDERSON, JEFFERSON COUNTY DRAINAGE DISTRICT #6
GENERAL MANAGER RONNIE E. PLATT, JEFFERSON COUNTY DRAINAGE DISTRICT #6
KIM CARROLL, CONSULTING ENGINEER, GARROD & DARTEX, JEFFERSON COUNTY DRAINAGE DISTRICT #6

THAD HEARTFIELD, JEFFERSON COUNTY DRAINAGE DISTRICT #6
MRS. HEARTFIELD, JEFFERSON COUNTY DRAINAGE DISTRICT #6
MANAGER TOM HOGAN, JEFFERSON COUNTY DRAINAGE DISTRICT #7
COMMISSIONER JOE LYDAY, JEFFERSON COUNTY DRAINAGE DISTRICT #7
MRS. LYDAY, JEFFERSON COUNTY DRAINAGE DISTRICT #7
COMMISSIONER M. J. "DUFFY" ADAIR, JEFFERSON COUNTY DRAINAGE DISTRICT #7

Mr. BEVILL. The committee will come to order.

We are always delighted to have our good friend and colleague, Congressman Jack Brooks. The Chair recognizes Congressman Jack Brooks who does the best job of presenting his case and gets more money than anybody I know of, too.

Mr. BROOKS. Thank you very much, Mr. Chairman.

I appreciate the opportunity to appear today and urge the subcommittee's favorable consideration of the public works projects for the 9th Congressional District included in the fiscal 1987 budget.

I support funding all those items included in the budget and in the interest of time submit a list of them.

I am pleased to report that our Clear Creek Construction Project is in the budget for $8,200,000, which is also the Corps of Engineers' capability, and I would appreciate your subcommittee's support for these funds. As you know, the residents in the Clear Creek watershed area have suffered tremendous losses over the years due to flooding and improper drainage. This project, upon completion, should correct this problem.

Also in the flood and drainage control category, the Taylors Bayou Project has been funded for construction for $8,600,000, the Corps of Engineers' capability. In addition, although separately authorized, the Hillebrandt Bayou and Tributaries project is vital to the complete success of the Taylors Bayou project and I am pleased that it, too, has been included in the fiscal year 1987 budget in the survey category for $50,000. I would urge your particular attention to and approval of these funds.

It is a pleasure to be here with no additional requests for funding other than that already included in the fiscal year 1987 budget. There is, however, one project, Wallisville Lake, which continues to be of great concern to me, although I am not at this time requesting an appropriation for construction.

As you know, the original project was placed under injunction in 1973 by a judge in Houston, Texas. A new project was subsequently developed and again brought before the same judge—he hasn't retired yet—in an effort to have the injunction lifted. The judge denied the lifting of the injunction, indicating that the Congress and the Corps had acted inappropriately. I wish to state for the record that it is my hope that we may still be able to proceed with this project and that I will be pleased to work with the subcommittee and committee in any way you may wish to get this project underway.

Mr. Chairman, again, I appreciate your kind consideration. All of these Federal public works projects are critical to the economic development of my district with its many petrochemical plants and heavy industrial operations that are so vital to our country and our

national security. Ports along the Texas Gulf Coast are an integral part of the economy of the nation. These projects insure the productivity and growth of that area and help to remove the ever present threat of flooding and its tragic effects.

I have with me a number of people vitally concerned and they are here to support these statements, the ones that I will submit, and answer any questions that you have.

With your permission, I would like to introduce them at this time.

Mr. BEVILL. Yes, we would like you to introduce them.

Mr. BROOKS. The Mayor of the City of Dickinson, Joe Molloy; Councilwoman Phyllis Lee on the front row; and Brenda Dickerson, a reporter from Friendswood Journal, City of Friendswood.

And from League City, we have Mayor Joe Lamb; and Mayor Pro tem Ed Poole; City Administrator Paul Nutting, Councilman Chester Davis.

From Nederland we have the City Manager, Howard McDaniel and Councilman Mike Bourque in the back row.

From Galveston County we have Judge Ray Holbrook on the first row; Commissioner Ron Crowder; Billy Jack Pegues; and Wayne Smith, consulting engineer who is with them. We are glad to have you, Wayne.

And from the County of Jefferson, my home county, we have the very distinguished county Judge Richard LeBlanc, and his lovely wife, Cheryl.

And from Clear Creek Drainage District, we have Vice President Frank Frankovich; from Galveston County Drainage District #2, Commissioner Marcus Junemann; and from Jefferson County Drainage District #3, Chairman LeRoy McCall. He is beginning to look like his daddy.

From Jefferson County, Drainage District #6, we have a full contingency. We have Commissioner Josh Allen, a builder down there; and Commissioner Pat Henderson, I.L. Henderson; General Manager Ronnie Platt, and Kim Carroll, Consulting Engineer; and their lawyer, Thad Heartfield. Then his manager is here with him, his wife, Corrie.

From Drainage District 7, Manager Tom Hogan, Commissioner Joe Lyday; and Commissioner Duffy Adair.

I want to submit for consideration of the subcommittee statements of Cities of Beaumont, Clear Lake Shores, Dickinson, Friendswood, Groves, League City, Nederland, Port Arthur, Texas City; Counties of Chambers, Galveston, Jefferson; Ports of Beaumont, Galveston, Port Arthur and Sabine Pass, and Chamber of Commerce of Galveston; Beaumont Navigation District; Coastal Soil and Water Conservation District; Harris County Flood Control District; Clear Creek Drainage District; Jefferson County Drainage Districts numbers 3, 6, and 7.

I thank you very much and appreciate it.

Mr. BEVILL. Thank you for a very fine presentation. You always make the best. That is why we scheduled you first. This is the first Member of Congress, or of the Governors and their delegations and so you see you rate mighty high with us.

Mr. BROOKS. You all have been more than kind.

Mr. BEVILL. So we will stand in recess now. We have a roll call and we will make that roll call.

Mr. BROOKS. Thank you very much, Mr. Chairman.

[Recess.]

[The above-mentioned statements follow:]

REMARKS OF CONGRESSMAN JACK BROOKS
BEFORE THE ENERGY AND WATER DEVELOPMENT SUBCOMMITTEE
OF THE HOUSE APPROPRIATIONS COMMITTEE
WEDNESDAY, APRIL 9, 1986

MR. CHAIRMAN, I THANK YOU FOR THIS OPPORTUNITY TO APPEAR TODAY TO URGE THE SUBCOMMITTEE'S FAVORABLE CONSIDERATION OF THE PUBLIC WORKS PROJECTS FOR THE NINTH CONGRESSIONAL DISTRICT OF TEXAS INCLUDED IN THE FISCAL YEAR 1987 BUDGET.

MR. CHAIRMAN, I SUPPORT FUNDING THOSE ITEMS INCLUDED IN THE BUDGET PROPOSAL AND IN THE INTEREST OF TIME WILL SUBMIT A LIST OF THEM WITH MY STATEMENT RATHER THAN DISCUSS EACH ONE INDIVIDUALLY.

I AM PLEASED TO REPORT THAT OUR CLEAR CREEK CONSTRUCTION PROJECT IS IN THE BUDGET FOR $8,200,000, WHICH IS ALSO THE CORPS OF ENGINEERS' CAPABILITY, AND I WOULD APPRECIATE YOUR SUBCOMMITTEE'S SUPPORT FOR THESE FUNDS. AS YOU KNOW, THE RESIDENTS IN THE CLEAR CREEK WATERSHED AREA HAVE SUFFERED TREMENDOUS LOSSES OVER THE YEARS DUE TO FLOODING AND IMPROPER DRAINAGE. THIS PROJECT, UPON COMPLETION, SHOULD CORRECT THIS PROBLEM.

ALSO IN THE FLOOD AND DRAINAGE CONTROL CATEGORY, THE TAYLORS BAYOU PROJECT HAS BEEN FUNDED FOR CONSTRUCTION FOR $8,600,000, THE CORPS OF ENGINEERS' CAPABILITY. IN ADDITION, ALTHOUGH SEPARATELY AUTHORIZED, THE HILLEBRANDT BAYOU AND TRIBUTARIES PROJECT IS VITAL TO THE COMPLETE SUCCESS OF THE TAYLORS BAYOU PROJECT AND I AM PLEASED THAT IT, TOO, HAS BEEN INCLUDED IN THE FISCAL YEAR 1987 BUDGET IN THE SURVEY CATEGORY FOR $50,000. I WOULD URGE YOUR PARTICULAR ATTENTION TO AND APPROVAL OF THESE FUNDS.

IT IS A PLEASURE TO BE ABLE TO COME BEFORE YOUR SUBCOMMITTEE WITH NO ADDITIONAL REQUESTS FOR FUNDING OTHER THAN THAT ALREADY INCLUDED IN THE FISCAL YEAR 1987 BUDGET. THERE IS, HOWEVER, ONE PROJECT - WALLISVILLE LAKE - WHICH CONTINUES TO BE OF GREAT CONCERN TO ME, ALTHOUGH I AM NOT AT THIS TIME REQUESTING AN APPROPRIATION FOR CONSTRUCTION.

As you know, the original project was placed under injunction in 1973 by a Judge in Houston, Texas. A new project was subsequently developed and again brought before the same Judge in an effort to have the injunction lifted. The Judge denied the lifting of the injunction, indicating that the Congress and the Corps had acted inappropriately. I wish to state for the record that it is my hope that we may still be able to proceed with this project and that I will be pleased to work with the Subcommittee and Committee in any way you may wish to get this project underway.

Mr. Chairman, again, I appreciate your kind consideration. All of these federal public works projects are critical to the economic development of my District with its many petrochemical plants and heavy industrial operations that are so vital to our country. Ports along the Texas Gulf Coast are an integral part of the economy of the nation. These projects insure the productivity and growth of that area and help to remove the ever present threat of flooding and its tragic effects.

I HAVE WITH ME TODAY A NUMBER OF PERSONS VITALLY CONCERNED WITH THESE PROJECTS. THEY ARE HERE TO SUPPORT THESE STATEMENTS AND TO ANSWER ANY QUESTIONS THE SUBCOMMITTEE MAY HAVE. I WOULD LIKE TO INTRODUCE THEM AT THIS TIME...

CITY OF DICKINSON

MAYOR JOSEPH F. MOLLOY

CITY OF FRIENDWOOD

COUNCILWOMAN PHYLLIS LEE

CITY OF LEAGUE CITY

MAYOR JOE L. LAMB
MAYOR PRO TEM ED POOLE
CITY ADMINISTRATOR PAUL NUTTING
COUNCILMAN CHESTER DAVIS
COUNCILMAN JEFF MALLIOS

CITY OF NEDERLAND

CITY MANAGER HOWARD MCDANIEL
COUNCILMAN MIKE BOURQUE

COUNTY OF GALVESTON

JUDGE RAY HOLBROOK
COMMISSIONER FRANK CARMONA
COMMISSIONER RON CROWDER
COMMISSIONER EARL LLEWELLYN
COMMISSIONER BILLY JACK PEGUES
WAYNE SMITH, CONSULTING ENGINEER, WAYNE SMITH & ASSOCIATES

COUNTY OF JEFFERSON

JUDGE RICHARD P. LEBLANC, JR.

Clear Creek Drainage District

Vice President A. Frank Frankovich

Galveston County Drainage District #2

Commissioner Marcus Junemann

Jefferson County Drainage District #3

Chairman LeRoy McCall

Jefferson County Drainage District #6

President Sam O. Smith
Vice President Robert C. Horn
Commissioner, Josh Allen
Commissioner Pat Henderson
General Manager, Ronnie E. Platt
Kim Carroll, Consulting Engineer, Garrod & Dartez
Thad Heartfield and Mrs. Heartfield

Jefferson County Drainage District #7

Manager Tom Hogan
Commissioner Joe Lyday and Mrs. Lyday
Commissioner M. J. "Duffy" Adair

I ALSO SUBMIT FOR THE CONSIDERATION OF THE SUBCOMMITTEE STATEMENTS IN SUPPORT OF THESE PROJECTS FROM THE FOLLOWING:

CITIES OF:

BEAUMONT
CLEAR LAKE SHORES
DICKINSON
FRIENDSWOOD
GROVES
LEAGUE CITY
NEDERLAND
PORT ARTHUR
TEXAS CITY

COUNTIES OF:

CHAMBERS
GALVESTON
JEFFERSON

PORTS OF:

BEAUMONT
GALVESTON
PORT ARTHUR
SABINE PASS

CHAMBERS OF COMMERCE OF:

GALVESTON

BEAUMONT NAVIGATION DISTRICT
COASTAL SOIL AND WATER CONSERVATION DISTRICT
HARRIS COUNTY FLOOD CONTROL DISTRICT
CLEAR CREEK DRAINAGE DISTRICT
JEFFERSON COUNTY DRAINAGE DISTRICTS NOS. 3, 6, AND 7

" " " " " "

NINTH DISTRICT, TEXAS PROJECTS
FY 1987 FUNDING REQUESTS
(Amounts in $ Thousands)

Project or Study	President's FY 1987 Budget	Corps' Capability	JB's Request
SURVEYS:			
Dickinson Bayou	$ 255	$ 255	$ 255
Hillebrandt Bayou and Tributaries	50	50	50
ADVANCE ENGINEERING AND DESIGN:			
Trinity River, Channel to Liberty	200	200	200
CONTINUATION OF PLANNING AND ENGINEERING:			
Texas City Channel	800	800	800
CONSTRUCTION:			
Clear Creek	8,200	8,200	8,200
Taylors Bayou	8,600	8,600	8,600
OPERATION AND MAINTENANCE:			
Double Bayou	600	600	600
Galveston Harbor and Channel	1,640	1,640	1,640
Gulf Intracoastal Waterway	13,127	13,127	13,127
Houston Ship Channel	11,790	11,790	11,790
Sabine-Neches Waterway	14,310	14,310	14,310
Texas City Channel	2,160	2,160	2,160
Wallisville Project-Trinity River	205	205	205

City of
CLEAR LAKE SHORES

931 CEDAR ROAD
CLEAR LAKE SHORES, TEXAS 77565
(713) 538-1113 or (713) 334-1034

MAYOR
R.S. Larrabee

COUNCILMEN
Toby Clark, Mayor Pro Tem
R. Geo. Dethlefsen
Charles W. Finnerty, Jr.
George Leisher

April 3, 1986

The Honorable Tom Bebill
Chairman of Energy & Water
Development Subcommittee
House Committee on Appropriations
U.S. House of Representatives
Washington, D.C. 20510

Dear Chairman Bebill:

The residents of communities surrounding in the Clear Lake/Clear Creek area must address several problems before the arrival of the 1986 hurricane season. The problems as we see them now are:

(1) decreased water absorption due to extensive development of the area;

(2) 146% increase of population in the past 15 years with no additional flood evacuation routes;

(3) restricted outflow for stream flooding from Clear Lake due to elevation of Highway 146, creating an effective levy;

(4) lack of compliance with a comprehensive flood plan.

We are also concerned that the subsidence problem we have been experiencing in the general Houston area for the past 40 years is being effectively dealt with.

The proposed $8,200,000 to be spent on the Clear Creek Flood Control Project would address three of our major problems in this area:

(1) construction of the second outlet, which would allow relief during severe stream flooding and with use of a gate provide shelter from tidal flooding;

(2) improve flood control in the Clear Creek area;

(3) require counties to enforce strict regulation to comply with the residual 100 year flood plain made by the Army Corps of Engineers. The extensive changes in our environment over the past few years increase our flood exposure. Combined with constricted evacuation, each hurricane season presents a greater likelihood of tragedy.

We believe that once this information is known and carefully examined, the proposed $8,200,000 will be appropriated to the Clear Creek Flood Control project.

Sincerely,

R. S. Larrabee

R. S. Larrabee
Mayor, Clear Lake Shores

City Of League City
Office of the Mayor

800 West Walker
League City, Texas 77573
(713) 332-3151

April 5, 1986

The Honorable Jack Brooks
Congress of the United States
House of Representatives
Washington, D.C. 20515

Dear Congressman Brooks:

The residents of the City of League City, Texas strongly support the expenditure of funds for the Clear Creek Flood Control Project. Extensive development along Clear Creek and the resulting increase in population density have made flood control along Clear Creek a major health and safety concern for both residents and public officials. If present and future development is to be managed effectively so that property can be protected and the public safety maintained, the proposed $8,200,000 appropriation for the project must be approved. Implementation of this badly needed project must not be delayed.

Your support and the support of the Congress is greatly appreciated.

Sincerely,

Joe L. Lamb
Mayor

:lfw

galveston
Chamber of Commerce
621 Moody, Suite 300
Galveston, Texas 77550
(409) 763-5326

April 10, 1986

The Honorable Tom Bevill
Chairman
Energy and Water Development Subcommittee
House Committee on Appropriations
Washington, D.C. 20515

Dea Mr. Bevill:

The Board of Directors of the Galveston Chamber of Commerce at their meeting on Tuesday, April 8, 1986, unanimously supported the budget appropriations for 9th District public works projects, including the $1,640,000.00 for the Galveston Harbor and Channel (see attached list).

We appreciate the opportunity to support Congressman Jack Brooks in his efforts to secure funding for these projects.

Thank you for your consideration.

Sincerely,

John D. Unbehagen

John Unbehagen
Chairman of the Board

JU:kh
enclosure

Projects included in the FY 1987 Budget

Clear Creek (construction)	$ 8,200,000
Dickinson Bayou (survey)	255,000
Galveston Harbor & Channel (oper. & maint.)	1,640,000
Gulf Intracoastal Waterway (oper. & maint.)	13,127,000
Hillebrandt Bayou & Tribs. (survey)	50,000
Houston Ship Channel (oper. & maint.)	11,790,000
Sabine-Neches Waterway (oper. & maint.)	14,310,000
Taylors Bayou (construction)	8,600,000
Texas City Channel (oper. & maint.)	2,160,000
Texas City Channel (survey)	800,000
Trinity River, Channel to Liberty (advanced engineering & design)	200,000
Wallisville Lake (oper. & maint.)	205,000

City of Beaumont

City Council
William E. Neild, Mayor
Joe Deshotel, Mayor Pro Tem
G. Wayne Turner, At Large
Nell Weisbach, Ward I
Mike Brumley, Ward II
Audwin Samuel, Ward III
David Moore, Ward IV

March 27, 1986

The Honorable Tom Bevil, Chairman
Energy and Water Development Subcommittee
House Committee on Appropriations
Washington, D. C. 20510

Dear Congressman Bevil:

Over the past several years, the City of Beaumont has continued to actively pursue solutions to the drainage problems that lie within its City limits. In order to address the problems, several years ago the citizens voted a substantial bond issue in order to pay for the City portion of improvements to significant drainage structures that lie within the City.

A necessary part of this effort to alleviate drainage problems in this part of the State has been the parallel improvements that have now commenced on the Taylor's Bayou Drainage and Flood Control Project that has, with your support, gotten underway. From the perspective of the citizens of Beaumont, we would ask for your support for the current year funding level of $8.6 million that is earmarked for continuation of this crucial project. We would also ask your favorable consideration for an additional $50,000 that is needed for a study of the Hillebrandt Bayou and Tributaries, inasmuch as this area also contributes greatly in the high flood situations to the drainage problems that occur within the City limits of Beaumont. It should be noted that both Taylor's Bayou and Hillebrandt Bayou serve as principal outfalls for all drainage improvements within the City of Beaumont, and improvements to them are necessary in order to maximize the effectiveness of the improvements that are being made within the corporate limits.

We have received considerable support from Congressman Jack Brooks over the years. In addition, we have appreciated your past efforts and hope that you can continue to support this project.

Sincerely,

William E. Neild
Mayor

WEN:dj

P. O. Box 3827 Beaumont, Texas 77704

VILLAGE OF DICKINSON

• 2716 Main • Dickinson, Texas 77539 • 713-337-2454

March 26, 1986

The Honorable Tom Bevill, Chairman
Energy and Water Development Subcommittee
House Committee on Appropriations
Washington, D.C. 20515

Dear Sir:

Attached please find a resolution passed and approved by our City Council on March 25, 1986, in support of the appropriation of $255,000.00 for the continued study of Dickinson Bayou.

We would at this time respectfully request your time and consideration in support of this matter.

Sincerely,

Joseph F. Holley
Mayor

JFM/di

R E S O L U T I O N

75-86

STATE OF TEXAS
COUNTY OF GALVESTON
CITY OF DICKINSON

A RESOLUTION OF THE CITY OF DICKINSON, TEXAS, SUPPORTING THE CORPS OF ENGINEERS' STUDY OF FLOOD CONTROL MEASURES ON DICKINSON BAYOU.

WHEREAS, major flooding has occurred along Dickinson Bayou and surrounding areas causing thousands of residents to live with a constant threat of more flooding; and

WHEREAS, extensive construction and development has taken place in this area since the last study by the Corps of Engineers of a benefit-to-cost ratio of a flood control project on Dickinson Bayou; and

WHEREAS, the Honorable Senate and House Energy and Water Development Subcommittees are considering allocation of funds; and

WHEREAS, the City of Dickinson is seeking adequate appropriations for the continued study by the Corps of Engineers of flood control measures on Dickinson Bayou; and

WHEREAS, it is imperative that a new determination be made regarding the benefit-to-cost ratio of a flood control project on Dickinson Bayou; and

WHEREAS, we urgently request that $255,000.00 be approved and designated to continue this study;

WHEREAS, the City Council of the City of Dickinson met in open session on March 25, 1986, and voted to approve this resolution;

NOW THEREFORE BE IT RESOLVED that the City of Dickinson, Texas, requests assistance and allocation of funds to complete the Corps of Engineers study of flood control measures on Dickinson Bayou.

PASSED AND APPROVED this the 25th day of March, 1986.

Joseph F. Molloy
Mayor

ATTEST:
Phyllis B. Bricker
Phyllis B. Bricker
City Secretary

CITY OF FRIENDSWOOD, TEXAS

CITY COUNCIL RESOLUTION NO. R 96-2

A RESOLUTION ENDORSING THE U.S. ARMY CORPS OF ENGINEERS CLEAR CREEK FLOOD CONTROL PROJECT; AND URGING THE UNITED STATES CONGRESS TO ACT FAVORABLY ON THE FY87 BUDGET.

WHEREAS, a serious flood problem exists in the Clear Creek Watershed where existing residential and commercial areas are periodically subject to extensive damages from rising waters in the creek; and

WHEREAS, in the City of Friendswood in July 1979, 1600 out of 3000 homes were flooded with coincident economic losses exceeding $38,000,000; and

WHEREAS, in the City of Friendswood in September 1979, 500 of these homes were again flooded; and

WHEREAS, in the City of Friendswood in January 1980, 75 of these homes were again flooded; and

WHEREAS, the citizens continue to suffer economic loss and mental anguish as a result of flooding; and

WHEREAS, the citizens have been donating their time and labor in an effort to clear the creeks and banks of debris; and

WHEREAS, the United States Congress in 1968 authorized the U.S. Army Corps of Engineers to design a flood control project which would provide a significant measure of protection from recurring flooding problems in the Clear Creek Watershed; and

WHEREAS, the study has been completed and a consensus has been achieved by all local sponsors and entities and endorsed by the 67th Texas Legislature; and

WHEREAS, the project has been approved by the U.S. Army Corps District in Galveston and the Corps Southwest Division; and

WHEREAS, further delays will significantly increase the cost of the project as well as the probability of additional flooding; NOW THEREFORE

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF FRIENDSWOOD:

THAT the City re-endorse the U.S. Army Corps of Engineers Clear Creek Flood Control Project; and

THAT the City urge the Congress of the United States to adopt the FY87 budget and appropriate construction funds to that the U.S. Army Corps of Engineers may begin the rectification work as soon as possible; and

THAT the City urge the Congress to take whatever additional action is necessary to expedite the project and thereby reduce the emotional, physical, and economic suffering due to flooding.

THAT the City Secretary forward official copies of this resolution to the President of the United States, to the Speaker of the House of Representatives and President of the Senate of the United States Congress, and to all members of the Texas Delegation to the Congress, with the request that this resolution be officially entered in to the Congressional Record.

PASSED, APPROVED AND ADOPTED THIS 17TH DAY OF MARCH, 1986.

Ralph L. Lowe
RALPH L. LOWE, MAYOR

Leon Brown
LEON BROWN, COUNCILMAN

Evelyn Newman
EVELYN NEWMAN, MAYOR PRO TEM

Phyllis Lee
PHYLLIS LEE, COUNCILMAN

Robert W. Wicklander
ROBERT WICKLANDER, COUNCILMAN

Jan Jordan
JAN JORDAN, COUNCILMAN

Joe D. Prihoda
JOE PRIHODA, COUNCILMAN

RESOLUTION NO. 86-09

WHEREAS, the Groves City Council supports the following public works projects that Congressman Jack Brooks will present before the House Committee on Appropriations and Senator Lloyd Bentsen will present before the Senate Committee on Appropriations for funding in the FY 1987 Budget:

a)	Clear Creek (construction)	$ 8,200,000
b)	Dickinson Bayou (survey)	255,000
c)	Galveston Harbor & Channel (operation & maintenance)	1,640,000
d)	Gulf Intracoastal Waterway (operation & maintenance)	13,127,000
e)	Hildebrandt Bayou & Tributaries (survey)	50,000
f)	Houston Ship Channel (operation & maintenance)	11,790,000
g)	Sabine-Neches Waterway (operation & maintenance)	14,310,000
h)	Taylors Bayou (construction)	8,600,000
i)	Texas City Channel (operation & maintenance)	2,160,000
j)	Texas City Channel (survey)	800,000
k)	Trinity River, Channel to Liberty (advanced engineering & design)	200,000
l)	Wallisville Lake (operation & maintenance)	205,000

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF GROVES, TEXAS:

THAT this body does hereby go on record as wholeheartedly supporting the above projects for funding in the FY 1987 Budget; and

BE IT FURTHER RESOLVED that a copy of this Resolution be furnished Congressman Jack Brooks, Senator Lloyd Bentsen, and members of the House and Senate Committees on Appropriations as evidence of the Groves City Council's support.

PASSED, APPROVED and ADOPTED this 24th day of March, 1986.

Sylvester Moore

Sylvester Moore, Mayor

ATTEST:

Gene K. Graham

Gene K. Graham, City Clerk

Homer E. Nagel, Mayor
Councilmen: R. A. (Dick) Nugent, Mayor Protem
Mike Bourque, Tom Lee, Jr., R. D. Sawyer
Howard McDaniel, City Manager

City of Nederland

P.O. Box 967 • Nederland, Texas 77627 • 409/727-2711

March 12, 1986

The Honorable Tom Bevill, Chairman
Energy and Water Development Subcommittee
House Committee on Appropriations
Washington, D. C. 20515

Dear Congressman Bevill:

This is to advise that the City of Nederland is situated in the Ninth Congressional District, Texas, and recommends your consideration of FY 1987 Budget appropriations for the following projects:

PROJECT	FY 1987 BUDGET
Clear Creek (construction)	$ 8,200,000
Dickinson Bayou (survey)	255,000
Galveston Harbor & Channel (oper. & maint.)	1,640,000
Gulf Intracoastal Waterway (oper. & maint.)	13,127,000
Hillebrandt Bayou & Tribs. (survey)	50,000
Houston Ship Channel (oper. & maint.)	11,790,000
Sabine-Neches Waterway (oper. & maint.)	14,310,000
Taylors Bayou (construction)	8,600,000
Texas City Channel (oper. & maint.)	2,160,000
Texas City Channel (survey)	800,000
Trinity River, Channel to Liberty (advanced engineering & design)	200,000
Wallisville Lake (oper. & maint.)	205,000

Your consideration of these recommendations is appreciated.

Respectfully,

CITY OF NEDERLAND

Homer E. Nagel
Mayor

/lc

cc: City Councilmen
Howard McDaniel, City Manager

NEDERLAND

Malcolm L. Clark, Mayor
Councilmembers: T. J. Hammond, Bennister J. Baptiste, Geraldine Hunt, Mayor Pro-Tem, Willie Lewis, Jr., Joe Cuccia, Charles T. Rhodes, Jr., Arthur J. Guidry, George Dibrell, Randy Holtom, City Manager

CITY of PORT ARTHUR

P. O. BOX 1089 • PORT ARTHUR, TEXAS 77641-1089 • AREA CODE 409 983-8121

March 24, 1986

The Honorable Tom Bevill, Chairman
Energy and Water Development Subcommittee
House Committee on Appropriations
Washington, D. C. 20515

SUBJECT: GULF INTRACOASTAL WATERWAY
(OPERATION AND MAINTENANCE)

Dear Chairman Bevill:

The City of Port Arthur fully supports the request for $13,127,000 for operation and maintenance of the Intracoastal Waterway System.

Approximately 12 miles of the busiest part of the waterway is within the City limits of Port Arthur, and it plays a vital role in serving the major industry of this area.

The City of Port Arthur would like to go on record in support of this important waterway system and encourages you to approve funds for continued operation and maintenance.

Sincerely,

malcolm Clark

Malcolm Clark
Mayor

Malcolm L. Clark, Mayor
Councilmembers:
Bannister J. Baptiste
Mayor Pro Tem
Joe Cuccia
Arthur J. Guidry
Randy Holtom
T. L. Hammond
Geraldine Hunt
Willie Lewis, Jr.
Charles L. Rhodes, Jr.
George Stilwell
City Manager

CITY of PORT ARTHUR
P. O. BOX 1089 • PORT ARTHUR, TEXAS 77641-1089 • AREA CODE 409 983-3321

March 20, 1986

The Honorable Tom Bevill, Chairman
Energy and Water Development Subcommittee
House Committee or Appropriations
Washington, D. C. 20515

SUBJECT: SABINE-NECHES WATERWAY
(OPERATION AND MAINTENANCE)

Dear Chairman Bevill:

The City of Port Arthur would like to go on record for approval of the Fiscal Year 1986 funds, $14,310,000, as requested by our Honorable Congressman Jack Brooks.

The economic wellbeing of all citizens in Southeast Texas and this Nation is dependent upon adequate deep water for the transportation of goods produced to serve the Nation. Approximately 11% of the Nation's oil supply is handled in this area.

Your favorable action would be appreciated.

Sincerely,

Malcolm Clark
Mayor

Malcolm L. Clark, Mayor
Councilmembers
Bannister J. Baptiste
Mayor ProTem
Joe Cuccia
Arthur J. Guidry
Randy Holiam
T. L. Hammond
Geraldine Hunt
Willie Lewis, Jr.
Charles L. Rhodes, Jr.
George Uthoff
City Manager

CITY of PORT ARTHUR

P. O. BOX 1089 • PORT ARTHUR, TEXAS 77641-1089 • AREA CODE 409 983-3321

March 20, 1986

The Honorable Tom Bevill, Chairman
Energy and Water Development Subcommittee
House Committee on Appropriations
Washington, D. C. 20515

SUBJECT: TAYLOR'S BAYOU
(CONSTRUCTION)

Dear Chairman Bevill:

The City of Port Arthur fully supports the request of Jefferson County Drainage District #6 for the Fiscal Year 1986 for $8,600,000, to plan for the construction of flood control on Taylor's Bayou, which drains the largest watershed area in Jefferson County.

Serious drainage problems in Beaumont and in the extraterritorial area of Port Arthur have caused major damage by the flooding of this Bayou. The flooding was caused by the normal development of the upper watershed area and heavy rains this past year.

The City of Port Arthur wishes to go on record in support of this flood control project and encourages you to aporove funds for the continuation of this project.

Sincerely yours,

Malcolm Clark

Malcolm Clark
Mayor

OFFICE OF THE MAYOR
CITY OF TEXAS CITY
PORT OF INDUSTRIAL OPPORTUNITY

EMMETT F. LOWRY
MAYOR

April 1, 1986

The Honorable Tom Bevill, Chairman
Energy and Water Development Subcommittee
House Committee on Appropriations
Washington, D. C. 20515

Subject: Texas City Channel (oper. & maint.)
Texas City Channel (survey)
Clear Creek (construction)
Dickinson Bayou (survey)

Dear Representative Bevill and Members of the Subcommittee:

On behalf of the City Commission and the citizens of Texas City we sincerely request your support for adequate appropriations for the Operations and Maintenance of the Texas City Channel and the Texas City Channel survey. The port of Texas City handles more than 33 million tons of shipping annually, the majority of which consists of raw and finished products from our multi-million dollar petro-chemical industries. The economic life of our community depends to a large degree upon the industries and the many supporting service and retail businesses. With the present falling crude prices, these improvements would significantly reduce transportation costs into Texas City and tend to increase local capital investment and create new employment opportunity thereby benefitting the overall local economy, which has been particularly hard hit this year.

Residents of the Dickinson and Clear Creek areas have been flooded repeatedly because of heavy rainfall. The Dickinson Bayou survey is absolutely essential as is the need for funds for Clear Creek construction to begin in order to relieve the problem on Clear Creek. The citizens of Galveston County passed a $5,000,000 bond program in November, 1985, to provide its local share of the cost to this vital program that affects so many of our citizens.

We urge your support of the above projects and their inclusion in the FY 1987 Budget. Should you have any specific questions pertaining to these projects, we will be most willing to cooperate in providing any information we have available for the use of your Committee.

Respectfully submitted,

Emmett F. Lowry
Mayor

EFL:ej

THE COUNTY OF CHAMBERS

P.O. BOX 939 / ANAHUAC, TEXAS 77514 / (409) 267-3671 OR 267-6117

March 17, 1986

ALMA L. TURNER
COUNTY JUDGE

STATEMENT

From: Alma L. Turner, County Judge, Chambers County, Texas, to be presented to the Energy and Water Development Sub-Committee on appropriations on April 9, 1986 at 10:00 a.m.

Chambers County requests that the Wallisville (operation and maintenance) Project funding remain included in the FY 1986 Budget.

The Wallisville Project is of great importance to Chambers County and should be considered in the top priority group for funding.

The continued funding of the Wallisville Project for operation and maintenance will result in the preserving and continued upkeep of the existing property and facilities.

Proper care and maintenance will protect the condition of the existing property when funds become available for completion under the Project Plans. When completed, the Project will be a great benefit for Chambers County.

Sincerely,

Alma L. Turner

Alma L. Turner
County Judge

ALT/ts

THE COUNTY OF CHAMBERS

P.O. BOX 939 / ANAHUAC, TEXAS 77514 / (409) 267-3671 OR 267-6117

March 17, 1986

ALMA L. TURNER
County Judge

STATEMENT

From: Alma L. Turner, County Judge, Chambers County, Texas, to be presented to the Energy and Water Development Sub-Committee on appropriations on April 9, 1986 at 10:00 a.m.

Chambers County requests that the Trinity River, Channel to Liberty (advanced engineering and design) Project funding remain included in the FY 1986 Budget.

The Trinity River, Channel to Liberty Project is of great importance to Chambers County and should be considered in the top priority group for funding.

The funding of the Trinity River, Channel to Liberty Project for advanced engineering and design will result in the future productivity of the river. When completed, the Project will be a great benefit for Chambers County.

Sincerely,

Alma L. Turner

Alma L. Turner
County Judge

ALT/ts

COUNTY OF GALVESTON

RAY HOLBROOK
COUNTY JUDGE

April 9, 1986

The Honorable Tom Bevill, Chairman
Energy and Water Development Subcommittee
House Committee on Appropriations
United States Senate
Washington, D.C. 20510

Re: Statement by the Galveston County Commissioners Court
on Behalf of the Galveston County Flood Control Projects

Dear Congressman Hatfield and Members of the Subcommittee:

Galveston County has been the local sponsor with the U.S. Corps of Engineers for the construction of various flood control projects in Galveston County since the first seawall was started in Galveston shortly after the 1900 Hurricane. The Galveston seawall has now been extended in length to approximately 10 miles protecting the most populated part of the City of Galveston.

In 1962 (some 14 years after the first local bond issue was passed), construction began on the seawall protecting the cities of Texas City and La Marque from the ravages of hurricanes and high tides of Galveston Bay. In addition, flood control projects have been initiated to prevent flooding along Highland Bayou in the cities of Hitchcock, Santa Fe, and La Marque, a project on which construction started in 1974 and was completed in 1982, and along Clear Creek in the cities of League City and Friendswood in cooperation with Harris County and Brazoria County Drainage District No. 4, although no construction has yet begun. Galveston County is also the local sponsor for a re-study of the flooding problems on Dickinson Bayou, a bayou which flooded 1,000 homes in 1979.

We appear before this Honorable Committee to urge your support for appropriations for these projects in Galveston County. We are specifically requesting appropriations for construction on Clear Creek, which is now ready for construction, and for continuation of the engineering survey work on a tributary of Dickinson Bayou.

DICKINSON BAYOU

The Galveston County Commissioners Court is urging this Honorable Committee to approve $255,000 for the Corps of Engineers to continue the study of flood control measures on Dickinson Bayou. This is extremely important to

Galveston County, inasmuch as over 1,000 homes were flooded along Dickinson Bayou during Tropical Storm Claudette in July of 1979 because of rains in the watershed area from 20 to 40 inches over a 24-hour period. This caused between $40,000,000 and $50,000,000 in damages along Dickinson Bayou, and Galveston County is anxious to act as a local sponsor to relieve the flooding conditions. The draft report completed by the Corps of Engineers in January, 1986, does not find a favorable benefit-to-cost ratio on the main channel of Dickinson Bayou. However, the report did find that on one of the tributaries, West Gum Bayou, there was an extremely high benefit-to-cost ratio for any of several construction projects. The Corps of Engineers is now determining whether a full public hearing should be held on the Dickinson Bayou Study, and subsequent to that, the final report will be prepared which will recommend construction on West Gum Bayou.

We are respectfully requesting that the $255,000 noted above, which is included in the Administration's budget, be approved so the Corps of Engineers can complete this study, and we can then initiate a construction project on West Gum Bayou. We hope you will agree that this study should be completed, and we sincerely hope you will favorably consider our request.

CLEAR CREEK FLOOD CONTROL PROJECT

The Galveston County Commissioners Court respectfully urges the Honorable Committee to approve $8,200,000 in construction funds for the Clear Creek Flood Control Project. These funds are included in the Administration's budget, and the U.S. Corps of Engineers is now ready to let a contract for the first phase of this project in FY 1986.

It is extremely important that the Clear Creek Flood Control Project begin construction in fiscal year 1986 and continue in FY 1987 with the funds recommended by the Administration. After approximately 14 years of planning, the Corps of Engineers made final engineering decisions on this project in 1983 and has completed detailed engineering design for the first phase which is from Clear Lake to just west of Highway 3. The Design Memorandum has been submitted to the Division Office of the Corps of Engineers and has been approved for construction. This project is designed to provide flood relief for over 500,000 people in the Clear Creek watershed in Galveston, Harris and Brazoria counties. It was also designed in such a way as to protect the sensitive environment of Clear Creek, and this decision received overwhelming public support in a January, 1982, public hearing. The three local sponsors--Galveston County, Harris County, and Brazoria County Drainage District No. 4--support the Corps of Engineers design which will accommodate a 10-year flood with the remainder of the 100-year flood plain to be protected by flood plain management.

In 1979, over 2,000 homes in Friendswood and League City along Clear Creek were flooded twice, in July from Tropical Storm Claudette and again in September. Several thousand homes were also flooded in Brazoria and Harris counties. Losses from flooding in these three counties from the 1979 floods

were well over $200,000,000. People are desperate to do something--almost anything--on Clear Creek, and the Corps of Engineers is trying to expedite this project.

Inasmuch as the Clear Creek Flood Control Project has been in the study and design stage for over 16 years (authorized in 1968), it is most urgent that construction start as soon as possible. The study has been a high priority by the Corps of Engineers and over $2,500,000 has already been spent. It would be disastrous to the people along Clear Creek if construction on this project does not begin after all of the time, effort, and money spent in detailed studies. We sincerely hope you will approve $8,200,000 in construction funds for FY 87 for the first phase of the project. Galveston County passed a $5,000,000 bond election in November, 1985, to provide its local share of the cost. Thus, we are ready, willing, and able to assume our local responsibility for this project.

Thank you for your consideration of these requests and for your time in allowing us to be present at these hearings. We stand ready to assist you in any way and to furnish any additional information you may require.

Sincerely,

GALVESTON COUNTY
COMMISSIONERS COURT

Ray Holbrook
RAY HOLBROOK, County Judge

Earl Llewellyn
EARL LLEWELLYN, JR.
County Commissioner, Precinct 1

Frank Carmona
FRANK CARMONA
County Commissioner, Precinct 2

Ron Crowder
RON CROWDER
County Commissioner, Precinct 3

Billy J. Pegues
BILLY J. PEGUES
County Commissioner, Precinct 4

2SSK86/ssk
(F/C Hearings 4/09)

Jefferson County
COMMISSIONERS' COURT
P. O. Box 4025
Beaumont, Texas 77704
(713) 835-8507

RICHARD P. LE BLANC, JR.
COUNTY JUDGE

NORMAN J. TROY
Comm. Pct. 1

JAMES A. SMITH, JR.
Comm. Pct. 2

DAVE SMITH, JR.
Comm. Pct. 3

ROLFE CHRISTOPHER
Comm. Pct. 4

March 13, 1986

The Honorable Tom Bevill, Chairman
Energy and Water Development Subcommittee
House Committee on Appropriations
Washington, D. C. 20515

Dear Congressman Bevill:

The Commissioners' Court of Jefferson County, Texas, would like to go on record in support of the following projects which pertain to Jefferson County and will be presented by Congressman Jack Brooks on Wednesday, April 9, 1986:

(1) Gulf Intracoastal Waterway
(2) Hillebrandt Bayou & Tributaries
(3) Sabine-Neches Waterway
(4) Taylors Bayou

It is our opinion that said projects should be included in the 1987 budget as these projects are vital to our area and are in the best interest of the citizens of Jefferson County.

Yours truly,

JEFFERSON COUNTY
COMMISSIONERS' COURT

R. P. LeBlanc Jr.

By
R. P. LeBLANC, JR.
County Judge

RPLJr:ss

Port of Beaumont

The Nation's Port 409-835-5367

March 25, 1986
File: 1829

BOARD OF COMMISSIONERS
W. R. KIMBROUGH, PRESIDENT
EDWARD W. COLLINS, VICE PRES.
DANIEL CLARK, JR.
GENE A. VAN METER
H. M. "HENRY" NIX
LE ROY S. CLARK

JAMES W. MARTIN
PORT DIRECTOR

B. G. MASTERS
EXECUTIVE MANAGING DIRECTOR
& SECRETARY-TREASURER

Honorable Tom Bevill, Chairman
Energy and Water Development Subcommittee
House Committee on Appropriations
Washington, D. C. 20515

Dear Congressman Bevill:

The Port of Beaumont Navigation District of Jefferson County, Texas strongly supports that item in the budget for public works for fiscal year 1987 which proposes a total of $14,310,000 for the continued operation and maintenance of the Sabine-Neches Waterway. We respectfully urge favorable consideration and action by your committee.

The Port of Beaumont Navigation District of Jefferson County, Texas is the agency which operates and maintains the public wharves of the Port of Beaumont.

Proper maintenance of this waterway is absolutely essential if the marine terminals with facilities located on this ship channel are to continue operating maximum efficiency. We respectfully urge your committee to approve the requested funds.

Respectfully,

B. G. Masters
Executive Managing Director

BGM:ac

cc: Honorable Jack Brooks
House of Representatives
Washington, D. C. 20515

District Engineer
Corps of Engineers
U. S. Army
Galveston, Texas

Mr. Walter Crawford
Chairman
Beaumont Navigation District
420 Mariposa
Beaumont, Texas 77701

Mr. D. L. Turpin, Engineer
Beaumont Navigation District
420 Mariposa
Beaumont, Texas 77701

PORT OF GALVESTON
TOTAL OPERATING PORT

April 4, 1986

The Honorable Tom Bevill, Chairman
Energy and Water Development Subcommittee
House Commiteee on Appropriations
Washington, D.C. 20515

Dear Sir:

We respectfully request your consideration of our comments on the following project included in the F.Y. 1987 budget.

GALVESTON HARBOR AND CHANNEL

(OPERATION AND MAINTENANCE)

The Port of Galveston's Harbor and Channel is authorized to be maintained at a 40 foot project depth. This depth is required on a regular basis for vessels serving the Port's two export elevators, the container terminal and general cargo vessels.

Port related activities account for approximately 50% of Galveston's economy.

The President's budget includes $1,640,000 for this work. We respectfully request your favorable consideration of this item.

Sincerely yours,

C. S. Devoy

CSD/cet

C. S. Devoy, Executive Director and General Manager
Galveston Wharves / P. O. Box 328 / Galveston, Texas 77553 / Telephone (409) 766-6105

March 13, 1986 Ref. 810.100

The Hon. Tom Bevill, Chairman
Energy and Water Development Subcommittee
House Committee on Appropriations
Washington, D.C. 20510

Dear Congressman Bevill:

We respectfully ask that you favorably consider the public works funds request, by our Congressman Jack B. Brooks, for the Operations and Maintenance of the Sabine Neches Waterway and the Gulf Intracoastal Waterway of Texas. Only minimally necessary funds are requested, to insure the operation and maintenance of these vital federal waterways.

The major refineries on our Sabine Neches Waterway annually produce a high percentage of America's energy fuels. The Waterway handles up to 38,000,000 S/T of commerce, including import crudes, domestic and export shipments as well. The economic and military security of America depends of keeping these vital waterways open, now and in the future.

The Gulf Intracoastal Waterway of Texas is an indispensable connecting link between hundreds of chemical and petrochemical plants and other refineries, here and across the Gulf Coast. Combined plant investment of these essential industries exceeds $30 billion, just on the Texas segments of the Gulf Intracoastal Waterway, alone, according to recent estimates.

No new construction is anticipated in these requests, and the funds appropriated are vital to our economy and national defense. Your favorable consideration is justified, we submit, and is respectfully requested.

FOR THE PORT COMMISSION

Ben Goldstein
Port Director

BG/vlw

cc: Port Commission & Counsel

SABINE PASS PORT AUTHORITY
SABINE PASS TEXAS 77655
P O BOX 1067 (713) 971-2411

March 11, 1986

The Honorable Tom Bevil, Chairman
Energy and Water Development SubCommittee
House Committee on Appropriations
Washington, D.C. 20515

Dear Sir:

We are very interested in several projects included in the FY 1987 budget. One of these is the Gulf Intercoastal Waterway (oper. & Maint.) for $13,127,000. This waterway is very important to the Gulf Coast as well as the rest of the Nation. We must keep this waterway open and in good condition for economic reasons now but it is a dire necessity in time of war. Some of us are old enough to remember the ships we lost in the Gulf of Mexico in World War 2.

The Sabine Pass Port Authority supports the efforts of the Energy and Water Development Subcommittee as well as all others involved in appropriations for the budget for these projects.

Sincerely,

R. J. Lemaire
President

RJL/rv

SABINE PASS PORT AUTHORITY
SABINE PASS, TEXAS 77655
P. O. BOX 1067 (713) 971-2411

March 11, 1986

THE HONORABLE TOM BEVIL, CHAIRMAN
Energy and Water Development Subcommittee
House Committee on Appropriations
Washington, D.C. 20515

Dear Sir:

We are very interested in several projects included in the 1987 budget. One of these is the Sabine-Neches Waterway, (oper. & Maint.) $14,310,000. This Waterway is of utmost importance to the whole Southeast Texas area and especially to our immediate vicinity. The economy of this part of Texas largely depend on this Waterway.

The Sabine Pass Port Authority supports the efforts of The Energy and Water Development Subcommittee as well as all others involved in appropriations for the budget for these projects.

Sincerely,

President

SABINE-NECHES WATERWAY

(TEXAS)

STATEMENT OF BEAUMONT NAVIGATION DISTRICT

OF JEFFERSON COUNTY, TEXAS, WEDNESDAY, APRIL 9, 1986

IN SUPPORT OF MAINTENANCE FUNDS FOR

SABINE-NECHES WATERWAY

To The Honorable Tom Bevil, Chairman
Energy and Water Development Subcommittee
House Committee on Appropriations
Washington, D. C. 20515

The Beaumont Navigation District of Jefferson County, Texas is the local sponsor of the Sabine-Neches Waterway as authorized by Congress.

The Sabine-Neches Waterway is a federally maintained navigation project extending from the Gulf of Mexico, through a jettied entrance at the mouth of Sabine Pass, inland to the deepwater ports of Port Arthur, Beaumont, and Orange, Texas, a total distance of approximately 84 miles. The project includes deep draft channels of the following dimensions; 42 feet deep and 800 feet wide across the Sabine Bank in the Gulf of Mexico; 40 feet deep and a varying width of 800 feet to 500 feet through the jetty channel; a depth of 40 feet and a width of 500 feet from the jetty channel to the Turning Basins at Port Arthur; a 40 foot depth and a 400 foot width from Port Arthur via the Sabine-Neches Canal and the Neches River to the Port of Beaumont; a 30 foot depth and a 200 foot width from mouth of Neches River upstream thru the Sabine River to the Port of Orange.

In addition to the above dry cargo ports, Mobil Oil Corporation, Texaco, Incorporated, Chevron, American Petrofina Company of Texas and Union Oil Company of California have located their major refineries along this ship channel. These five refineries have a total rated processing capacity of 1,556,000 barrels of crude oil per day. This is approximately 12% of the nation's refining capacity. A great majority of this crude oil is imported by tankers through this waterway and the ports and energy related industries along this channel have billions of dollars invested in pipe lines, tanks, wharves, docks and other plant installations. A recent survey reveals that a 50 million dollar energy related expansion program is about to get underway. Additional expansion is being programmed, the total outlay of which will exceed 70 million dollars. Other industries are expected to locate in the area.

In addition to providing crude oil to the local refineries, Sun Marine Terminals also furnishes others with considerable oil. The Department of Energy has invested in excess of 35 million dollars in Sunoco's Neches River facilities, not including the cost of a pipeline to the Hackberry Strategic Reserve Salt Dome oil storage terminal, nor does it include the development of the Big Hill Storage Terminal, the construction of which is underway. The majority of this commodity is foreign imported crude oil and the handling requires the use of many large tankers which further congest this already extensively used waterway.

All of the foregoing development is largely due to the existence of the Sabine-Neches Waterway, our area's life line to the world for its exports and imports.

This extensive and expanding complex comprises a critical basic energy related industry that is absolutely vital to the nation's economic and energy needs. Their diminution for any reason would have a deleterious effect nationally as well as regionally.

The Corps of Engineers found that in 1983, (the latest figures available), there was in excess of 55,000,000 tons of dry and liquid cargo shipping on this waterway, plus 40,000,000 tons of Gulf-Intracoastal traffic which also moved thru these channels. Shipping of this magnitude necessarily involves the use of a great many vessels which, of course, creates congestion on the waterway. To compound the problem the present size of the grain ships, oil tankers and other cargo ships using this waterway are such that an even deeper and wider channel is needed at times.

Recent studies by the Corps of Engineers and complaints from the shipping industry reflect that there is serious siltation and shoaling in the Gulf entrance

channel at Sabine, with extensive shoaling along several reaches of the inland channels. They find that these conditions will rapidly become worse, and, if not corrected, eventually the channel could be closed to deep sea navigation.

Correcting these conditions will decrease chances of collisions and groundings of the many hundreds of vessels carrying crude oil and refined products. Such occurrences, as stated by the Corps of Engineers in their environmental impact report "would result in adverse environmental impact and public health hazards". Failure to maintain the channel would result in severe adverse economic effects on the project area, the state and even the nation. Effects would include the loss of billions of dollars worth of facilities adjacent to the channel, loss of employment for thousands of people and disruption of the manufacture and transportation of a significant portion of the nation's "fossil fuel supply".

The Corps of Engineers' break down of the 14 million three hundred ten thousand dollars included in the proposed budget for F.Y. 1987 will be utilized for dredging the following sections of the Sabine-Neches Waterway: Sabine Bank Channel; Sabine Pass Outer Bar Channel; Port Arthur Canal; Port Arthur Turning Basins and lower reach of Sabine-Neches Canal.

As the sponsoring agency, Beaumont Navigation District stands ready to provide all needed disposal land areas, rights-of-way, relocations and confining structures for this project.

The District, representing the above mentioned many ports, refineries, grain elevators and other shippers using this Waterway, supported by our Congressman, the Honorable Jack Brooks, respectfully request your favorable consideration for the inclusion of 14 million three hundred ten thousand dollars in the F.Y. 1987 budget, in order that this badly needed work may be accomplished.

Respectfully submitted,

BEAUMONT NAVIGATION DISTRICT

By Walter J. Crawford
Walter J. Crawford, Chairman

TAYLORS BAYOU, TEXAS

STATEMENT OF BEAUMONT NAVIGATION DISTRICT OF JEFFERSON COUNTY, TEXAS, WEDNESDAY, APRIL 9, 1986 IN SUPPORT OF CONSTRUCTION FUNDS FOR TAYLORS BAYOU DRAINAGE AND FLOOD CONTROL PROJECT

To The Honorable Tom Bevil, Chairman
Energy and Water Development Subcommittee
House Committee on Appropriations
Washington, D. C. 20515

The Beaumont Navigation District, as one of the sponsors of the Taylors Bayou Drainage and Flood Control Project, is also responsible for the operation of the Navigation and Salt Water barrier gates near the mouth of Taylors Bayou.

Over a forty year period we have been in a position to observe the numerous artifical changes in the area that have adversely affected drainage of this stream.

The first set of existing gates were installed in 1937 and functioned as salt water barriers, not as flood gates. Later the J. D. Murphee Wildlife Management Area was created by constructing a system of levees along Taylors Bayou and the Intracoastal Canal restricting the natural course of flood waters across the wetlands into the Intracoastal and thence to the Gulf. Then in 1972, the Rhodair Gulley, Lakeside and Alligator Bayou pump stations of the Port Arthur Hurricane Protection System were installed. These pumps have a combined capacity of over two million gallons per minute and discharge into the lower reach of Taylors Bayou just above and below the salt water gates. These pumps operate during periods of flooding, raising the level of the Bayou which backs water up into homes and streets of Beaumont. State highway 73 running from Port Arthur west to Winnie is yet another obstruction to the traditional flow of water from the developed section of Beaumont toward the Gulf. During a rain of any magnitude, a one to three foot differential builds up on the North side of this highway, holding water on the developed areas of North Jefferson County.

Construction on Phase I is well advanced. The Outfall Canal and the Diversion Channel have been dredged and the Salt Water Barrier is 90% complete. Pipe lines have been relocated and a contract has been awarded for dredging that section of the Gulf-Intracoastal Waterway from mouth of Outfall Canal eastward to the Sabine-Neches Waterway. Therefore, it is important that sufficient funds be provided to continue this urgently needed work before more costly damages are inflicted on the home owners and the businesses of our community.

As one of the sponsoring agencies, Beaumont Navigation District stands ready to meet its commitments to furnish its share of the local assurances required.

The District, representing the people and industries of this district, and supported by our Congressman, the Honorable Jack Brooks, respectfully request that 8 million six hundred thousand dollars be included in the F.Y. 1987 budget, in order that this highly important work be continued.

Respectfully submitted

By Walter J. Crawford
Walter J. Crawford, Chairman

STATEMEMT OF JAMES B. GREEN, P. E., DIRECTOR OF THE HARRIS COUNTY FLOOD CONTROL DISTRICT AS SUBMITTED TO THE ENERGY AND WATER DEVELOPMENT SUBCOMMITTEE OF THE APPROPRIATIONS COMMITTEE OF THE UNITED STATES HOUSE OF REPRESENTATIVES

CLEAR CREEK

(Construction - $8,200,000)

JAMES B. GREEN, P. E.
DIRECTOR

HARRIS COUNTY FLOOD CONTROL DISTRICT
8615 NORTH MAIN STREET
PHONE (713) 691-8600
HOUSTON, TEXAS 77022

March 31, 1986

The Honorable Tom Bevill, Chairman
Energy and Water Development Subcommittee
House Committee on Appropriations
Washington, D. C. 20510

Chairman Bevill:

I am James B. Green, Director of the Harris County Flood Control District, a political subdivision of the State of Texas, created by the State Legislature in 1937 after a series of disasterous floods had ravaged our area, threatening life and property.

The 1935 flood inundated two thirds of the County, took 15 lives, and so silted up the Houston Ship Channel that it took eight months to clear it so that it was safe for navigation.

It was as a result of that continued flooding threat that the U. S. Army Corps of Engineers constructed the Addicks and Barker Dams reservoir system in the western portion of Harris County, a system that still provides major protection to our area.

So it is, Mr. Chairman, that I appeal to you and the honorable members of this Committee to consider favorably the public works projects before you that will guarantee our continued protection from the ravages of future floods.

I come to you on behalf of Harris County Judge Jon Lindsay and the members of Commissioner's Court, who have supported the Clear Creek project since its inception in 1966, both by resolution and by their active participation. Without their encouragement and help, the Flood Control District would not have been able to carry out its own maintenance and improvement efforts in the watershed while awaiting for the Corps project to begin.

As you and most of your Committee may or may not know, Harris County is located on the flat coastal plains of our State in an area subject to heavy and intense annual rainfall and the annual threat of hurricanes and tropical storms. It is, in my professional opinion, one of the absolutely most difficult areas to drain and protect from flooding in the United States.

This is borne out by the fact that in 1979, for instance, the Houston metropolitan area accounted for an estimated 43 percent of <u>all</u> claims paid by the National Flood Insurance Program.

Mr. Chairman and honorable members of the Committee, I believe that each and every Federal dollar spent on flood control projects in our area will be paid back many times over in just the cost of Federal insurance and other aid that will be necessary if such projects as the Clear Creek construction proposed by the Corps of Engineers are not funded and completed.

Over a period of years, we have seen the truth of this wisdom borne out by looking back at the costs we have sustained in our area as a result of flooding and comparing those costs to what it would take to improve our channels adequately.

Mr. Chairman and members of the Committee, we have waited long and with much anticipation for the Clear Creek project to get underway. If every person who has sustained damages to their homes and property as a result of flooding along this waterway could be here today, I do not know where we could find a room large enough to hold the meeting.

In December of 1981, the Corps of Engineers completed their draft of the General Design Memorandum for this project. We looked at this as a milestone in providing cost-effective flood protection for the residents of Harris County and Galveston County to the south. Now a request for funding of first phase construction work by the Corps is before your Subcommittee. I ask you on behalf of the citizens of our area to act favorably and expeditiously upon this request.

The Clear Creek Watershed drains approximately 260 square miles of flat, coastal plain which has a maximum elevation of approximately 75 feet. Clear Creek and its 17 tributaries drain into Clear Lake and from there into Galveston Bay which is recognized as the largest and most important (economically and ecologically) bay system along the Texas Gulf Coast.

This is a rapidly growing urban area which includes the site of the National Aeronautics and Space Administration Johnson Space Center, a number of local branches of national aerospace corporations and contractors, the homes of the technical and professional people who staff those facilities, and a portion of the spillover of the petrochemical oriented businesses that line the Houston Ship Channel.

Mr. Chairman, let me reiterate the Corps' statement on Flood Damage Reduction contained in their General Design Memorandum draft: "Flooding is a serious problem in the Clear Creek Watershed. Throughout the watershed, Clear Creek meanders and has a small channel capacity relative to the areas drained; consequently, flooding is experienced at frequent intervals throughout the area. As the area continues to be urbanized, the flooding increases in intensity and frequency. The flow of floodwaters in the watershed is impeded by the relatively flat topography. Clear Creek and its tributaries are crossed by numerous bridges and pipelines which further restrict the passage of flood waters and increase flood stages."

"In the Clear Creek basin, there are about 19,000 acres of land subject to flooding by the 100-year storm. Most of this area is along the main channel with a smaller amount along the various tributaries. In the 100-year flood plain, approximately 12,300 acres or 65 percent is urban and built-up; the reamining 6,700 acres are distributed between agricultural (1,200), forest and wetlands (2,700), water bodies (1,600) and vacant and open space (1,200). The 100-year flood plain is delineated on Figures I-2 and I-3; this flooding is coincidental with a tidal elevation of two feet above mean sea level in Galveston Bay. The flood plain shown is based on detailed hydraulic studies of the area."

"The area's vulnerability to tropical storms and hurricanes is another factor that demands flood control needs. The widespread flooding that accompanied tropical storm "Claudette" in July of 1979 emphasized the seriousness of this situation. This storm, which caused in excess of $227.5 million dollars in total damages, is regarded as the worst in the area's history. Within the Clear Creek Watershed, over 5,000 structures were flooded and the total residential and commercial damages exceeded $90 million dollars. Major floods in 1973, September of 1979, along with Hurricane Alicia in 1983 which caused an estimated $33.2 million in Harris County alone, also caused substantial flooding and economic loss along Clear Creek."

Clearly, the Corps of Engineers has identified the need to reduce the flood damages now being sustained in the Clear Creek Watershed on a recurring basis.

Much time and effort has gone into the Federally funded work the Corps of Engineers has already done. I realize the amount requested for their construction project is not that substantial, relatively speaking, but let me assure you that the completion of their work will have an immensely substantial benefit to our community, our State and our Nation.

Mr. Chairman and Honorable members of the Committee, these Federal dollars spent today will save many more Federal dollars in years to come.

Sincerely,

James B. Green

James B. Green, P. E.
Director

JBG:ch

CLEAR CREEK (TEXAS) FLOOD CONTROL PROJECT

THE CLEAR CREEK DRAINAGE DISTRICT OFFERS THIS STATEMENT IN SUPPORT OF THE U. S. ARMY CORPS OF ENGINEERS' CLEAR CREEK (TEXAS) FLOOD CONTROL PROJECT WITH THE REQUEST FOR CONTINUING CONSTRUCTION FUNDING IN FY-1987.

The Clear Creek Flood Control Project is an absolute necessity to the health, safety, and well-being of the people who live in the Clear Creek watershed. As the land in the watershed has undergone development, pastures and farmland have been converted to parking lots, streets, runways, buildings, and other surfaces from which rain water runs off extremely rapidly. Although there have been, and continue to be, improvements made to drainage arteries in the region by local agencies, consistent with their resources, and although storm water run-off and flood plain control has been in effect in the counties of the Clear Creek watershed since 1979-80, the effects of land development and subsidence have already reached the point that Clear Creek simply cannot carry storm water away to Galveston Bay fast enough to keep water out of our homes. So, until Clear Creek is improved in its water handling capacity, we do not have the ability to make substantial improvement to the flood hazards that our citizens are living with every day.

People here realize that it is not feasible to prevent flooding by a storm like Claudette which struck this area in July, 1979, and dropped 30-40 inches of rain on us in a two-day period. However, our people are getting water in their homes when much less spectacular rains occur -- five-year to ten-year frequency precipitation is causing flooding. Even those people who are not getting water in their homes are impacted: street flooding is so severe that emergency vehicles cannot get through. A fire or serious medical problem occuring during, or for many hours after, such rains, would go unanswered in many places.

The Corps of Engineers has devised a plan for improving Clear Creek that is economically sound (benefit to cost ratio of 2.6), environmentally acceptable, and will completely contain the watershed run-off for a ten-year frequency storm. Furthermore, the 100-year flood plain will be reduced by 25% overall in the watershed, and by as much as 75% in some portions of the watershed. We fervently hope that appropriation of construction funds will <u>again</u> be approved and included in the FY-1987 Budget. The project is not frivolous, nor a convenience type of improvement--it deals with people's safety and health, both physical and psychological. Many of our people fear rain; anxiety levels run very high when a heavy rain lasts more than a couple of hours, especially when water starts to rise in the streets and into people's yards!

Gentlemen, we NEED the Clear Creek Project and respectfully request that the additional construction funding of $8 million be included in the FY-1987 Budget.

Carl L. Smith, President
CLEAR CREEK DRAINAGE DISTRICT

March 25, 1986

CLEAR CREEK DRAINAGE DISTRICT

GALVESTON COUNTY, TEXAS

RESOLUTION NO. 86-2

A RESOLUTION ENDORSING THE U. S. ARMY CORPS OF ENGINEER'S CLEAR CREEK FLOOD CONTROL PROJECT, STATE OF TEXAS: AND URGING THE UNITED STATES CONGRESS TO CONTINUE CONSTRUCTION FUNDING OF THE PROJECT IN THE FY-87 BUDGET.

WHEREAS, the Clear Creek Watershed includes portions of Galveston County as well as parts of Harris County and Fort Bend County, and

WHEREAS, a serious flood problem exists in the Clear Creek Watershed where existing residential and commercial areas are subject to extensive damages from rising waters in Clear Creek and its tributaries, and

WHEREAS, the Clear Creek Drainage District is the agency responsible for flood control in those portions of Clear Creek and its tributaries within its District, and

WHEREAS, the taxpayers of the District made a substantial committment in 1982 to the concept of self-help by voting an increase in taxes for flood control, and

WHEREAS, in spite of the increased taxes, the amount by which the flood hazard in the District can be reduced without a major project to increase the flow capacity of Clear Creek is severely limited, and

WHEREAS, the scope of the work required to achieve the necessary improvements on Clear Creek requires the extensive technical/management resources that the Corps of Engineers can provide, and

WHEREAS, the cost of the improvements needed on Clear Creek far exceeds the financial capabilities of local entities, and

WHEREAS, the benefits of the Corps of Engineers Clear Creek Project would include substantial reductions in claims against the National Flood Insurance Program, and

WHEREAS, flood losses in the City of Friendswood, which lies within the boundaries of the Clear Creek Drainage District, has resulted in it being the eleventh highest community in the nation in terms of number of flood claims, and

WHEREAS, the residents in the District continue to experience economic loss as a result of unnecessarily frequent flooding, and

WHEREAS, the residents of the District continually suffer extreme mental anguish because of the frequent threat of flooding, as well as the flooding itself, and

WHEREAS, the Clear Creek Drainage District, within the limits of its resources, and with the cooperation of other local governmental agencies, as well as individual citizens who have donated their time and labor, has been clearing debris and executing structural improvement projects in the creeks to increase their capacity, and

WHEREAS, the U. S. Army Corps of Engineers has designed a cost effective flood control project as authorized by the United States Congress which will provide a significant measure of protection from recurring flooding problems in the Clear Creek Watershed, and

WHEREAS, Congress approved $2 million to start construction of the Clear Creek Flood Control Project in the federal budget for fiscal year 1986, and

WHEREAS, delays will significantly increase the cost of the project as well as the probability of additional flooding, now, therefore

BE IT RESOLVED BY THE BOARD OF SUPERVISORS OF THE CLEAR CREEK DRAINAGE DISTRICT OF GALVESTON COUNTY:

THAT the District reendorse the U. S. Army Corps of Engineers Clear Creek Flood Control Project, and

THAT the District urge the Congress of the United States to recognize that the Corps of Engineers Clear Creek Project is not a mere convenience item, but is absolutely necessary in order to restore the quality of life of thousands of people to a reasonable condition that they have every right to expect, and

THAT the District urge the Congress of the United States to approve the $8 million necessary to continue funding for construction of the project in the FY-87 budget.

THAT the District urge the Congress to take whatever additional action is necessary to expedite the project and thereby reduce the emotional, physical, and economic suffering due to flooding.

PASSED, APPROVED, AND ADOPTED THIS 25th DAY OF MARCH, 1986.

Carl L. Smith

Carl L. Smith, President of the Board
Clear Creek Drainage District

ATTEST:

Frank J Bejarano

Frank J. Bejarano, Secretary of the Board
Clear Creek Drainage District

JEFFERSON COUNTY DRAINAGE DISTRICT NO. 3
P. O. Box 120
Hamshire, Texas 77622-0120
(409) 243-2116

March 27, 1986

The Honorable Tom Bevill, Chairman
Energy and Water Development Subcommittee
House Committee on Appropriations
Washington, D. C. 20515

RE: Energy and Water Development Subcommittee of the House Committee on Appropriations on Public Works Projects FY 1987 Budget - Taylor's Bayou (construction, $8.6 million)

Dear Congressman Bevill:

Construction of the Taylor's Bayou Flood Control Project is well under way and is on schedule. The success of the project is the result of the efforts of our Congressman, the Honorable Jack Brooks, and your cooperation and willingness to support such worthwhile projects as this.

Since the work began, the outfall channel for the project has been completed, and the widening and deepening of the Intercoastal Waterway is underway. The salt water barrier and the seven (7) salt water intrusion gates are nearly completed. This means that Phase 1 of the project is almost finished. It is of vital importance that Phase 2 of the project be continued and finished as soon as possible in order to tie in the overall project so that flooding of homes, residential areas and vital farm land will no longer continue.

The Corps of Engineers has informed us that they are ready to go ahead with Phase 2 and the 8.6 million allocated in the currently proposed budget for the continued work on this project is of vital importance to the area.

Jefferson County Drainage District No. 3 is requesting your support and assistance in having this amount included in the budget for the fiscal year 1987.

Yours very truly,

LeRoy McCall, Jr.
Chairman

LMjr:egs

Jefferson County

Drainage District No. 6

6550 Walden Rd. · Beaumont, Texas 77705

Telephone (409) 842-1818

Established in 1920

Sam O. Smith
PRESIDENT
Robert C. Horn
VICE PRESIDENT - SECRETARY
Joshua W. Allen, Sr.
COMMISSIONER
Patricia A. Henderson
COMMISSIONER
Robert B. Rodgers
COMMISSIONER

R. E. Platt
GENERAL MANAGER

March 18, 1986

The Honorable Tom Bevil, Chairman
Energy and Water Development Subcommittee
House Committee on Appropriations
Washington, D.C. 20515

Dear Senator Bevil:

The Taylors Bayou Drainage and Flood Control Project, a joint local-federal effort, is moving ahead on schedule to help in resolving many drainage and flooding problems long suffered by people living in Jefferson County. This success is the result of individual efforts by our own Congressman, The Honorable Jack Brooks, and by your able leadership and willingness to support worthwhile projects of this nature.

Since actual work has begun, two (2) dredging contracts have been completed, a third has been let with work to start within weeks, a saltwater barrier has been nearly completed, several major levees have been relocated to allow the channel widening and several pipelines have been adjusted. Once the third dredging contract and the saltwater barrier are finished, all of Phase I of this large undertaking will be in service.

Phase II is well underway with the acquisition of right of way and spoil disposal areas plus the purchase of mitigation land to satisfy the requirements set forth by environmental interests. This phase of the project has been accomplished with local funds.

The funding level for construction in the forthcoming year is anticipated to be $8.6 million and we wholeheartedly support that request.

In connection with drainage and flood control improvements associated with the Taylors Bayou Project, the District requests your favorable consideration of $50,000 for the Hillebrandt Bayou and Tributaries Survey.

Additionally the District also supports the funding requests for the Sabine-Neches Waterway (O & M) in the amount of $14.3 million and the Gulf Intercoastal Waterway (O & M) in the amount of $13.1 million.

Your active support in obtaining funding for these projects is greatly appreciated.

Sincerely,

Sam O. Smith, Chairman

COMMISSIONERS

EUGENE RASHETA
CHAIRMAN

M. J. ADAIR
JULIAN B. COGHILL, JR.
ROY M. KING
JOE LYDAY

JEFFERSON COUNTY
DRAINAGE DISTRICT NO. 7

T. F. HOGAN, III
MANAGER

W. C. VITTUM
ENGINEER

P.O. BOX 3244
PORT ARTHUR, TEXAS 77640

April 9, 1986

The Honorable Tom Bevill, Chairman
Energy and Water Development Subcommittee
House Committee on Appropriations
Washington, D. C. 20515

Re: Appropriations for Continued Construction
Taylors Bayou Project
Jefferson County, Texas

Gentlemen:

Jefferson County Drainage District No. 7, as one of the local sponsors of the Taylors Bayou Project, wishes to endorse the proposed $8,600,000.00 provided in the fiscal year 1987 budget for the continued construction of this vital drainage project.

Sixty percent of Jefferson County and most of the 107 square miles of Jefferson County Drainage District No. 7 drain into the Taylors Bayou system, either through pumping stations or by gravity flow. Restricted outlets have not only hindered the flow of water within the District, but have aggravated flooding in upland areas.

This project includes the widening and deepening of the existing channels, construction of a bypass channel, and the installation of salt water gates. Completion of these improvements will result in the realization of the full benefits of existing and planned upstream drainage projects.

Originally recommended by the Corps of Engineers in 1948, the completion of this project is today, a necessity.

We request the Committee's approval of the $8,600,000.00 proposed in the 1987 budget.

Respectfully submitted,

JEFFERSON COUNTY DRAINAGE DISTRICT NO. 7

Eugene Rasheta

Eugene Rasheta, Chairman

ER/pae

Transit-Mix

CONCRETE AND
FOUNDATION COMPANY

D. PAT WHEAT
D. P. WHEAT, JR.
WARREN GOEHRINGER
MARK W. STILES

2255 LOUISIANA AVENUE
P.O. BOX 5187 BEAUMONT, TEXAS 77702
AREA CODE XXX 835-4933

March 27, 1986

The Honorable Tom Bevill, Chairman
Energy and Water Development Subcommittee
House Committee on Appropriations
Washington, D.C. 20515

Dear Representative Bevill:

Subject: Statement Supporting Taylor's Bayou Project
Jefferson County, 9th District of Texas

Thank you for allowing me the opportunity to make this statement in support of the Taylor's Bayou Flood Control Project. I represent a citizens' committee which successfully passed a bond issue election in 1979 for $15 million, as the major part of our local share of the project. Please consider the following:

1. Over $39 million in damages to homes, businesses, roads, and crops occurred as a result of two severe floods in 1979.

2. The local share is committed and the bonds are sold.

3. A favorable public hearing on the Environmental Plan was held in December, 1980, and resulted in no major changes in the design.

4. The project has been under construction for the past three years, and the funds requested this year will substantially complete the First Phase and eliminate a serious bottleneck at the outfall.

5. I am for reducing Federal expenditures and balancing our budget; however, Federal funds always seem to end up in flood disaster areas to help cover losses in the form of flood insurance payments, low interest loans, and grants. The same funds should be spent to prevent the loss, when possible.

This fund request should be considered as an investment in the future of the petrochemical center of our nation. Further development in our area is hampered by inadequate drainage. I urge your support of this item in the Appropriations Bill for Water Development in Texas.

Yours very truly,

D P Wheat Jr.

D. P. Wheat, Jr.
Chairman, Jefferson County Flood
Control Project Committee

WEDNESDAY, APRIL 9, 1986.

TRINITY RIVER BASIN PROJECTS

WITNESSES

MARTIN FROST, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF TEXAS
RUSSELL H. PERRY, PRESIDENT, TRINITY IMPROVEMENT ASSOCIATION
BLAKE GILLEN, PRESIDENT, TRINITY RIVER AUTHORITY OF TEXAS
HONORABLE ANNETTE STRAUSS, MAYOR PRO-TEM, CITY OF DALLAS
GREG PATTON, PRESIDENT, JOE POOL LAKE PLANNING COUNCIL
HOMER SMITH, MANAGER, PORT OF LIBERTY
CAROL DINKINS, HOUSTON CHAMBER OF COMMERCE
CARL RIEHN, EXECUTIVE DIRECTOR, NORTH TEXAS MUNICIPAL WATER DISTRICT

Mr. BEVILL. The committee will come to order.

We are always pleased to have our good friend and colleague, Congressman Martin Frost. We will be glad to hear from you now, Martin.

Mr. FROST. Mr. Chairman, I appreciate the opportunity to appear before this committee. Each year since being elected to Congress, I have come before you to support the testimony of the Trinity Improvement Association. It has become one of the highlights of spring for me to join with the men and women who travel to Washington to show support for the improvement projects that mean so much to our communities in Texas.

This year, over 60 members of the Association have made the trip. They have traveled to Washington at their own expense because they care about their communities and believe in the projects you will consider today.

As you know from previous years, I am supportive of all the TIA projects. However, I have always had a special interest in Joe Pool Lake. While Joe Pool Lake is located primarily within the 24th District, its completion and development is vital to the entire North Texas region. And, even before the boundaries of my district were changed to include Joe Pool, I made a special point to come before you and to speak on its behalf.

The Lake is now very near completion with dedication ceremonies scheduled for next month. I intend to take part in the ceremonies and again join with many of the good people here today to celebrate the fine achievement that Joe Pool represents.

It is important, though, that as projects like Joe Pool Lake near completion, we maintain the funding needed for their continued development and proper operation and maintenance. The funding requests before you today include $9.7 million for Surveys, Advanced Engineering and Design at Joe Pool Lake and $351,000 for Operation and Maintenance. I strongly urge the committee to approve these funding levels so that we can continue on with this project.

Even before its completion, Joe Pool has had a positive effect on the surrounding communities. Property values have been enhanced and tax bases enlarged. The project is a perfect example of government working with communities to prepare for the future and improve the quality of life for generations to come.

I appreciate the opportunity to again appear before you and ask that the committee favorably consider the testimony offered by Trinity Improvement Association representatives this morning.

I think at this point that Russell Perry will join us at the table. I believe, Russell, you will be making the primary presentation on behalf of the group. He is a very respected businessman from the Dallas area who has taken an interest in the economic future and development of North Texas.

I am pleased to be here with him today.

Mr. PERRY. Thank you, Mr. Chairman, I appreciate those remarks.

Mr. Chairman and members of your committee, it is a pleasure to come before you and visit with you again. You have always been so friendly and kind to us that we appreciate it. I am, as you know, President of the Trinity Improvement Association, and I am interested in what is going on to try to improve the situation for our area and our water needs, and in the nation as a whole.

I have been asked to be the spokesman this morning for the delegation which I think our Congressman told you about 60, but there are actually 63 who paid their way to be here today to talk about it. So I think that would indicate we have very much interest in what is going on.

We want to present some additional testimony in support of the water projects vital to our area. The delegation includes county commissioners, mayors, council members, Chamber of Commerce officials, port and water utility managers and representatives of water districts and river authorities. They come from 20 different cities located in the upper, middle and lower reaches of the river and from Houston, which is outside the basin but receives water from the Trinity River. I believe they were just ahead of us here.

I might add that the delegates have traveled here at their own expense, with our Association serving as coordinator. While the group is diverse geographically, we are united in purpose.

With regard to the fiscal year 1987 budget for civil works projects for the Corps of Engineers, we note that the nationwide budget request for a total of $3.078 billion represents an increase of 32 percent over the comparable figure for fiscal year 1986. Because these projects create the infrastructure on which our economic growth and quality of life depend, we support this budget even in times of dire budget problems.

Moreover, much of this proposed expenditure will be paid back with interest while also contributing to the economy in payment for services and materials. The net cost to the Federal government for the fiscal year 1987 civil works program, after offsetting charges and contributions are taken into account, would be $2,850 billion, up only 24 percent from fiscal year 1986. This indicates a larger share of the costs will be borne by local interests or by users of the projects.

Because of the Federal budget deficit, we support this trend in cost sharing.

As you will note in the summary of requests which appears at the beginning of our written testimony, this delegation supports the budget request for $60,585,000 for 14 projects as listed for the

Corps of Engineers and $1,600,000 for one project for the Bureau of Reclamation. The Corps request for Trinity basin projects is down some $16 million as compared to the fiscal year 1986 budget request.

The drop is largely because our two major construction projects, Lake Ray Roberts and Joe Pool Lake, are approaching completion. We had hoped the budget request would have contained more funds for Cooper Lake, which was delayed for 13 years by Federal court order, causing a huge escalation in costs and hardship to the communities which are still waiting for this water.

We believe it would be in order for the committee to consider funding this project to the revised Corps capability which was not available at the time the budget requests were being finalized. We recommend the full funding on the Bureau of Reclamation's Bedias Creek investigation. If this project proves feasible, it will greatly benefit the middle and lower Trinity basin and metropolitan Houston.

We also have an administrative request concerning the Wallisville project. The project remains under injunction by a Federal judge who has recently determined that Congress acted improperly in its actions on the fiscal year 1986 appropriation act. We do not agree with this ruling which we expect to see appealed.

We are extremely grateful for the time which this committee has allotted us for this presentation. Please accept our appreciation for the job you have done, in these difficult times, in maintaining sound water development programs that have proved their economic and environmental soundness.

Mr. Chairman, I wish to submit for the record a complete list of our delegation appearing here today and copies of the testimony to be given by our group.

Again, thank you for allowing us to appear before this committee; and we urge your favorable consideration of our requests.

With these remarks, I would like to call on a few members of the delegation who will speak briefly on projects of specific concern to their areas.

The first speaker will be Mr. Blake Gillen, President of the Trinity River Authority of Texas.

[The statement of Mr. Perry follows:]

SUBCOMMITTEE ON ENERGY
& WATER DEVELOPMENT
COMMITTEE ON APPROPRIATIONS
HOUSE OF REPRESENTATIVES
TRINITY IMPROVEMENT ASSOCIATION
APRIL 9, 1986

SUMMARY OF REQUESTS - FY 1987

On behalf of the Trinity River of Texas delegation, the Trinity Improvement Association recommends the support of the Congress for the following projects of the Corps of Engineers and the Bureau of Reclamation in considering the Energy and Water Development Appropriations Bill for Fiscal Year 1987.

FUNDING REQUESTS:

PROJECT	BUDGET REQUEST
CORPS OF ENGINEERS	
SURVEYS, ADVANCE ENGINEERING & DESIGN	
TRINITY RIVER CHANNEL TO LIBERTY, TX	$ 200,000
CONSTRUCTION	
COOPER LAKE	$ 3,700,000
JOE POOL LAKE	$ 9,700,000
RAY ROBERTS LAKE	$ 34,000,000
OPERATIONS & MAINTENANCE	
BARDWELL LAKE	$ 743,000
BENBROOK LAKE	$ 1,080,000
DENISON DAM - LAKE TEXOMA	$ 4,304,000
GRAPEVINE LAKE	1,523,000
JOE POOL LAKE	$ 351,000
LAVON LAKE	$ 1,895,000
LEWISVILLE DAM	$ 1,893,000
NAVARRO MILLS LAKE	$ 855,000
RAY ROBERTS LAKE	$ 136,000
WALLISVILLE LAKE	$ 205,000
TOTALS	$ 60,585,000
U. S. BUREAU OF RECLAMATION	
GENERAL INVESTIGATIONS	
BEDIAS CREEK	$ 1,600,000

ADMINISTRATIVE REQUESTS

An administrative request on Wallisville will be provided to the Committee prior to mark-up, if needed.

STATEMENT OF THE
TRINITY IMPROVEMENT ASSOCIATION
TO THE
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT
COMMITTEE ON APPROPRIATIONS
HOUSE OF REPRESENTATIVES
APRIL 9, 1986

MR. CHAIRMAN AND MEMBERS OF THE COMMITTEE:

My name is Russell H. Perry of Dallas, Texas, and I am President of the Trinity Improvement Association. You have heard testimony from our Congressional representatives concerning some of our needs. I have been asked to act as spokesman for this delegation which you have been so courteous as to grant a hearing. Numbering 63 persons, we represent interests from throughout the Trinity River basin of Texas. We are here to present additional testimony in support of water projects vital to our area. The delegation includes county commissioners, mayors, council members, Chamber of Commerce officials, port and water utility managers and representataives of water districts and river authorities. They come from 20 different cities located in the upper, middle and lower reaches of the river and from Houston, which is outside the basin but receives water from the Trinity River. I might add that the delegates have traveled here at their own expense, our Association serving as coordinator. While the group is diverse geographically, we are united in purpose.

WITH REGARD TO THE FISCAL YEAR 1987 BUDGET FOR CIVIL WORKS PROJECTS FOR THE CORPS OF ENGINEERS, WE NOTE THAT THE NATIONWIDE BUDGET REQUEST FOR A TOTAL OF $3.078 BILLION REPRESENTS AN INCREASE OF 32% OVER THE COMPARABLE FIGURE FOR FY 1986. BECAUSE THESE PROJECTS CREATE THE INFRASTRUCTURE ON WHICH OUR ECONOMIC GROWTH AND QUALITY OF LIFE DEPEND, WE SUPPORT THIS BUDGET EVEN IN TIMES OF DIRE BUDGET PROBLEMS. MOREOVER, MUCH OF THIS PROPOSED EXPENDITURE WILL BE PAID BACK AT INTEREST WHILE ALSO CONTRIBUTING TO THE ECONOMY IN PAYMENT FOR SERVICES AND MATERIALS. THE NET COST TO THE FEDERAL GOVERNMENT FOR THE FY 1987 CIVIL WORKS PROGRAM, AFTER OFFSETTING CHARGES AND CONTRIBUTIONS ARE TAKEN INTO ACCOUNT, WOULD BE $2.850 BILLION, UP ONLY 24% FROM FY 1986. THIS INDICATES A LARGER SHARE OF THE COSTS WILL BE BORNE BY LOCAL INTERESTS OR BY USERS OF THE PROJECTS. BECAUSE OF THE FEDERAL BUDGET DEFICIT, WE SUPPORT THIS TREND IN COST SHARING.

AS YOU WILL NOTE IN THE SUMMARY OF REQUESTS WHICH APPEARS AT THE BEGINNING OF OUR WRITTEN TESTIMONY, THIS DELEGATION SUPPORTS THE BUDGET REQUEST FOR $60,585,000 FOR 14 PROJECTS AS LISTED FOR THE CORPS OF ENGINEERS AND $1,600,000 FOR ONE PROJECT FOR THE BUREAU OF RECLAMATION. THE CORPS REQUEST FOR TRINITY BASIN PROJECTS IS DOWN SOME $16 MILLION AS COMPARED TO THE FY 1986 BUDGET REQUEST. THE DROP IS LARGELY BECAUSE OUR TWO MAJOR CONSTRUCTION PROJECTS, LAKE RAY ROBERTS AND JOE POOL LAKE, ARE APPROACHING COMPLETION. WE HAD HOPED THE BUDGET REQUEST WOULD HAVE CONTAINED MORE FUNDS FOR COOPER LAKE, WHICH WAS DELAYED FOR 13 YEARS BY FEDERAL COURT ORDER, CAUSING A HUGE ESCALATION IN COSTS AND HARDSHIP TO THE COMMUNITIES WHICH ARE STILL WAITING FOR THIS WATER. WE BELIEVE IT WOULD BE IN ORDER FOR THE

COMMITTEE TO CONSIDER FUNDING THIS PROJECT TO THE REVISED CORPS CAPABILITY WHICH WAS NOT AVAILABLE AT THE TIME THE BUDGET REQUESTS WERE BEING FINALIZED. WE RECOMMEND THE FULL FUNDING ON THE BUREAU OF RECLAMATION'S BEDIAS CREEK INVESTIGATION. IF THIS PROJECT PROVES FEASIBLE, IT WILL GREATLY BENEFIT THE MIDDLE- AND LOWER TRINITY BASIN AND METROPOLITAN HOUSTON.

WE ALSO HAVE AN ADMINISTRATIVE REQUEST CONCERNING THE WALLISVILLE PROJECT. THE PROJECT REMAINS UNDER INJUNCTION BY A FEDERAL JUDGE WHO HAS RECENTLY DETERMINED THAT CONGRESS ACTED IMPROPERLY IN ITS ACTIONS ON THE FY 1986 APPROPRIATION ACT. WE DO NOT AGREE WITH THIS RULING WHICH WE EXPECT TO SEE APPEALED.

WE ARE EXTREMELY GRATEFUL FOR THE TIME WHICH THIS COMMITTEE HAS ALLOTTED US FOR THIS PRESENTAITON. PLEASE ACCEPT OUR APPRECIATION FOR THE JOB YOU HAVE DONE, IN THESE DIFFICULT TIMES, MAINTAINING SOUND WATER DEVELOPMENT PROGRAMS THAT HAVE PROVED THEIR ECONOMIC AND ENVIRONMENTAL SOUNDNESS.

MR. CHAIRMAN, I WISH TO SUBMIT FOR THE RECORD A COMPLETE LIST OF OUR DELEGATION APPEARING HERE TODAY AND COPIES OF THE TESTIMONY TO BE GIVEN BY OUR GROUP.

AGAIN, THANK YOU FOR ALLOWING US TO APPEAR BEFORE THIS COMMITTEE; AND WE URGE YOUR FAVORABLE CONSIDERATION OF OUR REQUESTS.

WITH THESE REMARKS, I WOULD LIKE TO CALL ON A FEW MEMBERS OF THE DELEGATION WHO WILL SPEAK BRIEFLY ON PROJECTS OF SPECIFIC CONCERN TO THEIR AREAS.

NEXT PAGE

THE FIRST SPEAKER WILL BE MR. BLAKE GILLEN, PRESIDENT OF THE TRINITY RIVER AUTHORITY OF TEXAS.

(MR. GILLEN MAKES HIS STATEMENT)

THE FOLLOWING STATEMENT WILL BE PRESENTED BY THE HONORABLE ANNETTE STRAUSS, MAYOR PRO-TEM OF THE CITY OF DALLAS.

(MAYOR PRO-TEM STRAUSS MAKES HER STATEMENT)

THE NEXT PRESENTATION WILL BE BY MR. GREG PATTON, PRESIDENT OF THE JOE POOL LAKE PLANNING COUNCIL.

(MR. PATTON MAKES HIS STATEMENT)

THE NEXT SPEAKER WILL BE MR. HOMER SMITH, MANAGER OF THE PORT OF LIBERTY.

(MR. SMITH MAKES HIS STATEMENT)

THE FOLLOWING STATEMENT WILL BE BY MRS. CAROL DINKINS, REPRESENTING THE HOUSTON CHAMBER OF COMMERCE.

(MRS. DINKINS MAKES HER STATEMENT)

THE FINAL STATEMENT WILL BE BY MR. CARL RIEHN, EXECUTIVE DIRECTOR OF THE NORTH TEXAS MUNICIPAL WATER DISTRICT.

(MR. RIEHN MAKES HIS STATEMENT)

NEXT PAGE

59-750 O—86——3

MR. CHAIRMAN, ON BEHALF OF THE WHOLE DELEGATION, THANK YOU FOR ALLOWING US TO APPEAR BEFORE THIS COMMITTEE. AS WE STATED LAST YEAR, IN THESE TIMES OF BUDGET DEFICIENCIES, WE STAND READY TO BEAR OUR PART OF THE BURDEN. WE ASK ONLY THAT THE RETURN ON INVESTMENTS TO THE NATION'S ECONOMY AND THE SOUNDNESS OF FEDERAL PARTICIPATION IN TRINITY RIVER BASIN WATER RESOURCES DEVELOPMENT BE TAKEN INTO CONSIDERATION IN ARRIVING AT YOUR DECISIONS.

AS ALWAYS, IT HAS BEEN A PLEASURE TO APPEAR BEFORE YOU.

Mr. PERRY. I would like to introduce Mr. Merl Godfrey, Mr. Chairman, who is really my boss, sitting back there somewhere.

Mr. GODFREY. I carry water for him. That is why he wants me here.

Mr. BEVILL. We are glad to have you with us. Those things you are submitting there including the roster of everyone that is here will be made a part of the record. This is always impressive to the committee when the leaders, civic leaders of an area, are interested enough to pay their own transportation and come to Washington and leave your businesses, that is always impressive to us, so your presence does count.

It is very important, and we appreciate the way Martin handles everything. I know you do, too.

Mr. PERRY. We sure do.

Mr. BEVILL. We work very closely with him and he does a very outstanding job. He is one of the most effective Members of Congress, and I may be preaching but we that work with him know that, too.

Mr. PERRY. Thank you, Mr. Chairman.

I think we have our first speaker, Mr. Blake Gillen, President of the Trinity River Authority of Texas.

Mr. GILLEN. Mr. Chairman and members of the subcommittee, I am Blake Gillen of Corsicana, Texas, I am a member of the Board of Directors of the Trinity River Authority of Texas, TRA, representing Navarro County and currently serve as the Authority's President of the Board.

TRA endorses and requests your support for the funding recommended in the Administration's fiscal year 1987 budget for those projects we support as local sponsors.

Joe Pool Reservoir. We are pleased to report to you that the Fort Worth District of the U.S. Army Corps of Engineers began the intentional impoundment of water in Joe Pool Lake on January 7, 1986. TRA supports the recommended fiscal year 1987 appropriation of $9.7 million for the continuation of construction on this most important water project. As the water level rises, the public demand for recreation access to Joe Pool Lake will increase commensurately.

Facilities to allow for access will only become available through appropriations made for 1987 and a few years beyond.

Bedias Reservoir. The need to evaluate additional water supplies to provide for future needs within the lower Trinity River basin and along the upper Gulf Coast of Texas becomes a more pressing reality every year. And appropriation of the recommended $1.6 million will enable the U.S. Department of the Interior's Bureau of Reclamation to continue their studies of a potential Bedias Lake. We urge your continuing support for this important Federal study effort.

Just ten days ago a Federal Judge in Houston turned down the Corps of Engineers and local sponsors' request to lift the environmental injunction that has prevented this project from moving forward since 1973. Judge Bue said in his 43 page opinion in sum, ". . . Congress, in 1983, authorized a project based on incomplete NEPA documents. Therefore, in 1983, Congress was not statutorily

fully informed and could not make a well considered decision as mandated by the very purpose of NEPA."

Mr. Chairman, at this time the Corps of Engineers and local sponsors with legal counsel involvement are evaluating this quote, along with similar ones, found in the Judge's Opinion. Once it is determined what remedies or actions are needed to go forward, this committee certainly will be informed of what our next step will be.

With your permission, I am providing a copy of Judge Bue's decision for the committee so that continued design work can be accomplished.

[The information follows:]

SIERRA CLUB

LONE STAR CHAPTER

April 9, 1986

The Honorable Tom Bevel
Chair
Energy and Water Development Subcommittee
Appropriations Committee
U.S. House of Representatives
H 218 House Office Building
Washington, D.C. 20515

Dear Chairman Bevel,

On behalf of the Lone Star Chapter of the Sierra Club I am submitting the enclosed information to your subcommittee concerning funding for the Wallisville Dam project. We are sorry we cannot attend your hearings but I am sure you and your members will understand the problems of a volunteer organization and the requirement to earn a living which keeps us from attending committee meetings in Washington, D.C. We request that these comments be placed in the official hearing record for the FY 1987 appropriations' bill.

Our first two enclosures concern why the Wallisville project is not cost efficient or needed. There are alternatives, all much cheaper, to this project. The water provided will be dirty, weed-choked, and miniscule in amount. We urge you to strongly consider these fact sheets when looking at whether more taxpayer's dollars, during soaring budget deficits and required Gramm-Rudman budget cuts, need to be thrown away after the already wasted millions for this unnecessary project. In particular note our third enclosure which shows that the existing three water supply lakes for the City of Houston can be operated more efficiently which would eliminate the need for the Wallisville Dam.

Our second major concern is that on March 25, 1986 Federal District Court Judge Carl O. Bue handed down a ruling of immense importance with reference to the Wallisville Dam and the actions of this subcommittee and committee.

Judge Bue ruled that the Corps of Engineers and Congress did not meet the requirements of the National Environmental Policy Act in the Wallisville case. In Judge Bue's own words,,"... the requirements of NEPA have never been met in any respect. In sum, Congress simply exceeded its authority and infringed the Corps' sphere while the NEPA process was under way.", "There has been no good faith pursuit of the environmental assets and liabilities of Wallisville by the Corps for Congress to consider.", and finally that, "... this Court is compelled to conclude that bad faith existed on the part of the Corps.". It is imperative that this appropriations committee and subcommittee take careful cognizance of Judge Bue's decision, a copy of which is enclosure IV, as its results were partially precipitated by the actions of this committee and subcommittee.

As a result the Lone Star Chapter of the Sierra Club would like to make several requests:

1.) That the information submitted with this letter be studied carefully and with full attention by the subcommittee and full appropriations committee.

2.) That the information also be circulated to other members of Congress so that the full Congress is informed on this matter.

3.) That no further action be taken by the appropriations committee on the Wallisville Dam project until a complete legal resolution occurs both in court and under NEPA and Corps procedures as set out under the law.

4.) That the Lone Star Chapter be kept informed by the subcommittee and the full committee of any future proposed actions on the Wallisville Dam Project so that we can input and participate fully and express our concerns.

Finally the Lone Star Chapter of the Sierra Club wishes to make it clear that we oppose unalterably the completion of the Wallisville Dam project due to its environmental destructiveness and economic infeasibility.

We appreciate this oportunity to express our views and concerns and extend the invitation to all members of the subcommittee and full committee to come to Houston, Texas and visit onsite the beautiful Wallisville area. Please contact us if you have any questions at all. We look forward to hearing from you soon on this important matter.

Sincerely,

Brandt Mannchen

Brandt Mannchen
Chairperson
Water Resources Committee
Lone Star Chapter of the Sierra Club
1515 Missouri #17
Houston, Texas 77006
W713-645-5316
H713-522-1489

THE ECONOMIC AND ECOLOGIC SIGNIFICANCE OF THE GALVESTON BAY SYSTEM AND THE TRINITY RIVER

Robert W. McFarlane, Ph.D.
Ecologist

The Galveston Bay System (Galveston, Trinity, East and West Bays) is the most productive estuary on the Texas coast. Its importance is clearly reflected in the commercial and sports fisheries which it supports. The average commercial harvest amounts to more than 20 million pounds of fishes, crabs, oysters and shrimp worth $44 million at the dock annually. This fishery creates 2100 jobs and $20 million of income for the immediate region. In addition, sport fishermen spend $4 million, land 650,000 pounds of fish, and create 255 jobs worth $1.5 million in additional income each year.

How does the Galveston Bay System differ from other Texas estuaries? What ecologic features of this estuary interact to create such a perfect environment for fish and shellfish? The principal feature of Galveston Bay is that it is the only **humid** bay system along the Texas barrier island coast; it has lower temperatures and higher precipitation than any other Texas estuary. The amount of precipitation which falls on the bay exceeds the amount of water which evaporates from the surface. More importantly, the Trinity and San Jacinto Rivers together provide the largest freshwater inflow of any Texas drainage basin. The effect of this abundant freshwater can be readily seen in the swamp forests and the freshwater and brackish marshes which line the waterways, the rice fields which dominate the surrounding agricultural landscape, and the vegetation of the bay itself. Other Texas estuaries feature submerged grassbeds where several species of grass are rooted in the bottom but do not emerge above the surface of the water. Galveston Bay is characterized by emergent grasses, standing in permanent water but rising high above the water surface in full sunlight. These large expanses of grass along the edge of the bay provide the plant material which fuels the food chain, and protective habitat where juvenile shrimp and fishes grow rapidly while shielded from their natural enemies.

The large input of freshwater from the surrounding environment affects the salinity of Galveston Bay water. The Gulf of Mexico contains 34 parts per thousand (ppt) of "salt" (that is, 3.4%). If no freshwater were to enter Galveston Bay for an extended period, the bay waters would come into equilibrium with the Gulf waters due to the daily tidal interchange of waters. But salinities in the bay are much lower, and highly variable throughout the year, due to local and distant rainfall, tropical storms, etc. River water entering the bay has zero salinity. Large areas surrounding the river mouths may range from 5 to 10 ppt, while much of Trinity Bay and upper Galveston Bay may reach 15 to 20 ppt. West Bay and East Bay, closest to the Gulf passes, may reach 25 to 30 ppt salinities. The key feature of Galveston Bay is that its waters contain substantially less salt than other Texas estuaries, which are increasingly salty as you travel south and west down the coast toward arid regions.

The Trinity River provides 55 percent of the freshwater that enters the Galveston Bay ecosystem, while the San Jacinto River supplies only 16 percent. These rivers provide two other ingredients which are essential to the continued health and productivity of the bay - sediment and nutrients. Sediments carried downstream via river transport are important to coastal bays because they provide inorganic nutrients and the raw materials that create and maintain the delta areas where the brackish and freshwater marshes grow. Other nutrients are produced by decomposition of terrestrial plant material throughout the drainage basin, continually washed into the river systems by rainfall runoff. These organic nutrients are essential to the growth and development of many animals in the complex estuarine food chains. Any development which interferes with the transport of these essential raw materials - freshwater, sediments, and nutrients - will eventually contribute to the degradation of the Galveston Bay ecosystem.

Adverse impacts on the Galveston Bay ecosystem can result from many types of developments and human activity. For example, both Buffalo Bayou and the San Jacinto River empty into the Houston Ship Channel. The artificially deepened channel, and the spoil banks which line the channel, prevent the river and bayou water entering the bay from spreading out, slowing down, and depositing the suspended sediment. As a result, there is very little delta and marsh area in this region. The proposed widening and deepening of the Houston Ship Channel will aggravate this situation, and also permit more dense saltwater from the Gulf to penetrate farther into the bay, raising salinity levels and threatening the valuable oyster seed beds near the channel. Housing developments along the shoreline continually nibble away at shoreline wetlands, destroying valuable habitat and food resources for marine life in the bay. The proposed Lake Creek, Cleveland, and Bedias reservoirs will reduce the flow of freshwater, sediment, and nutrients into upper Galveston Bay.

The Trinity River is the key tributary entering Galveston Bay. The river basin extends to Dallas and Fort Worth, encompasses 3.2 million people, and produces 5.6 million acre-feet of water in an average year. The amount of surface water already authorized or claimed for diversion and use amounts to 5.3 million acre-feet. None of this water is designated to flow into the bay. There are already 27 major reservoirs in existence in the drainage basin, and 4 more are under construction. Under the 1985 Texas Water Plan none are required to provide any freshwater inflow to Trinity Bay. At present 5.4 million acre-feet of water typically reach the mouth of the river; an absolute minimum of 3.2 million acre-feet will be required to maintain seafood productivity in the Galveston Bay ecosystem. Lake Wallisville will further reduce the flow of freshwater and trap sediments and nutrients. During extended periods of low river flow, no water will pass Lake Wallisville. It is not difficult to envision the day when all of the claimants to Trinity River water remove their full share and the river runs dry.

It is imperative that the Galveston Bay System be viewed holistically as a complete ecosystem. Each potential impact must be judged for its contribution to the cumulative impact resulting from all human activity affecting the estuary. The bay is presently beseiged from all sides with numerous environmental insults. It must not be allowed to follow Chesapeake Bay and become an ecological disaster.

Enclosure II

THE WALLISVILLE COALITION
FACT SHEET FOR THE WALLISVILLE LAKE PROJECT

HISTORY OF THE PROJECT

The Wallisville Lake, Texas project was authorized by Congress in 1962 for the PURPOSES of SALINITY CONTROL, NAVIGATION, WATER SUPPLY, FISH AND WILDLIFE ENHANCEMENT, and RECREATION. The project's LOCAL SPONSORS were the Trinity River Authority, the City of Houston, and the Chambers-Liberty Counties Navigation District.

Construction was begun in 1966. Passage of the National Environmental Policy Act (NEPA) forced the Corps of Engineers to prepare an environmental impact statement (EIS) for the project. The 1970 Draft EIS was inadequate. In 1971, the Sierra Club, Houston Audubon Society, and others filed a lawsuit opposing the project until a comprehensive EIS was prepared. The District Court found that the Wallisville project was an integral part of the Trinity River Project (a barge canal to Dallas, authorized in 1965) and enjoined further construction, then 72% complete. The Appeals Court remanded the requirement tying it to the Trinity River Project in 1974 but left the injunction in place pending completion of a Final or Supplemental EIS.

The Corps then conducted extensive environmental studies in 1975 and discovered that the authorized 19,700 acre project would cause substantial environmental damage and degradation. The Corps redesigned the project and, in 1981, issued a Post Authorization Change Report (PACR) and Final EIS. The PACR recommended reducing the size of the project to 5,600 acres by relocating the dam. It also found that fish and wildlife resources would not be enhanced and that losses of $989,000 could be expected for each and every year that the project was in operation. Furthermore, the PACR found that no navigation benefits would result from the project due to insufficient river traffic. The PACR also recommended that the excess public lands be retained in public ownership.

The PACR and Final EIS were submitted to the Corps' Bureau of Engineers for Rivers and Harbors (BERH) for approval. The BERH found that the PACR had overestimated water benefits and failed to meet the Appeals Court decree for the Final EIS. Furthermore, since two of the five original purposes (navigation, fish and wildlife enhancement) could not be met, and the project had been substantially modified and reduced to 28% of the authorized project size, the new Recommended Project should be returned to Congress for reauthorization. This latter step was crucial because the reauthorized project would have to use 7 5/8%, rather than 3 1/8%, interest discounting and the local sponsors would have to pay for 70%, rather than 1%, of the project costs. In 1982 the Corps issued a Supplemental Information to the Post Authorization Change Report (SIPACR) which claimed new calculations found both navigation benefits and fish and wildlife enhancement. This was accomplished by substantially modifying the No-Action Alternative, a required EIS component which estimates future conditions if the project is not constructed. The PACR No-Action Alternative was abandonment of the partially constructed dam and transfer of project land to the Texas Parks and Wildlife Dept. for fish and wildlife management. The SIPACR No-Action Alternative was construction of the lake and dam by local sponsors regardless and transfer of excess land to private developers for subdivision and resale.

In 1985 the Corps asked the District Court to lift its injunction since the Congress had reauthorized the project. In 1986 the District Court left in injunction in force and directed the Corps to coordinate the SIPACR with the federal agencies and resubmit the project to Congress for proper reauthorization.

PROJECT BENEFITS

WATER SUPPLY - Claim: The Wallisville Dam will provide 140 million gallons per day of urgently needed new water for the City of Houston.

Fact: Seventy-eight percent of the water which flows past the Wallisville Dam site is released from Lake Livingston, where it is already available to the City water supply. The only water to be "saved" is that water currently released from Lake Livingston to control salinity near the river mouth. The claim does not indicate how many days per year this 140 MGD will be saved. Lake Livingston must release up to 1000 CFS of water as needed to control salt water intrusion. The irrigation season extends from March 1 to September 30. The Corps of Engineers has claimed that 1100 CFS is needed; the Trinity River Authority has reported to the Federal Energy Regulatory Commission that only 500 CFS are required. Data from the US Geological Survey station at Romayor, the lowermost river gage on the Trinity River, indicate flows less than 1000 CFS, which includes irrigation and industrial water to be diverted, are common during the irrigation season. Average monthly flows less than 1000 CFS have occurred during five months, and less than 500 CFS during two months, of the irrigation season. It appears that the amount of "new" water which Wallisville will generate has been grossly overstated. Furthermore, there is no delivery system to transport the water from Wallisville to those areas of Houston where it is most needed. Additionally, the City has no immediate plans to begin construction of the Luce Bayou interbasin diversion project, its principal means to transport Lake Livingston water from the Trinity River to Lake Houston.

Alternatives: (1) Construct a single-purpose water reservoir upstream at River mile 18 which the Corps has identified at the best site on the lower Trinity River for water supply purposes. (2) Transport existing but unutilized water from the Toledo Bend Reservoir to Houston via the Sabine River and a canal system.

NAVIGATION - Claim: Barge traffic on the Trinity River above Wallisville amounts to 114 round trips to Moss Bluff and 28 round trips to Liberty each year.

Fact: The Texas Gulf Chemicals facility at Moss Bluff, which formerly shipped liquid sulfur downriver, was permanently closed in 1980 when the sulfur resource was depleted. The facility has been dismantled and sold and there are no plans to resume sulfur mining at this location. On February 23, 1986, the Liberty Vindicator published a photo of the first barge in nearly two years to reach Liberty. Thus potential barge traffic has been grossly overestimated and there are no navigation benefits to be derived from the Wallisville Lake Project, as the PACR correctly indicated.

SALINITY CONTROL - Claim: Annual benefits of $801,000 from salinity control.

Fact: Salinity control is the only project purpose with merit. However, the benefits of salinity control have been overstated. Neither the Corps nor the Trinity River Authority have estimated the amount of water necessary for salinity control in an average year. During 1978, a bona fide drought year with rainfall in the Trinity River Basin only 69% of normal, 261,000 acre-feet of water worth $860,000 as agricultural water, was released from Lake Livingston to control salinity. However, during years of above normal rainfall very little, if any, water is needed, and then for relatively brief periods.

Alternative: Construct salt water barriers across the river at optimum sites, as is presently done on the Sabine and Neches Rivers.

FISH AND WILDLIFE ENHANCEMENT - Claim: The SIPACR claims benefits of $122,000 per year from keeping excess project lands away from private developers.

Fact: The U.S. Fish and Wildlife Service has testified that nothing could be done to enhance the extremely high productivity of the existing Wallisville area as fish and wildlife habitat. Any development will degrade these resources which depend on adequate freshwater inflow of the Trinity River and freedom to move between freshwater, brackish water, and saltwater habitats. The estimated losses of nearly $1 million per year are conservative and probably underestimated. Fish and wildlife enhancement cannot be claimed as a purpose of the project.

RECREATION - Claim: The SIPACR claims recreational benefits of $625,000 per year.

Fact: Wallisville Lake will not be cleared of its vegetation and timber before flooding. It will be maintained at a 2 foot depth until the water supply is needed, perhaps by 1997, and then it will be maintained at its maximum 4 foot depth for the remainder of the project's life. This shallow, weed-choked wading pond will favor the development of "rough fish" rather than the more desirable game fish species, according the the Corps' own projections. Neither swimming nor water skiing will be possible. The slow death of the cypress swamp will reduce its aesthetic and recreational value to all users.

Alternative: Permit the substantial existing recreational use to continue as it will benefit far more persons to utilize the area without degrading the recreational resource.

ENVIRONMENTAL CONSEQUENCES

The existing Wallisville Lake area supports an exceedingly rich biological community. Ninety-five percent of the fishes and shellfishes are of estuarine or marine origin. It is an invaluable nursery area for shrimp, crabs and finfish. The freshwater, nutrients, and sediments transported by the river are essential for the health and continued growth of the marshes which harbor and support these organisms. The Texas Department of Water Resources has estimated that 3.2 million acre-feet of freshwater inflow and three floods per year are necessary to maintain this biological productivity. This flow has failed to materialize during 15 years since 1925. The Wallisville Dam will seriously reduce the flow of water and frequency of floods. Even during wet years it will reduce the lateral flow of water through the adjacent marshes, impeding the import and export of nutrients in these areas. The Corps has admitted that during drought years river flow past the dam will be exceedingly low or nonexistent for periods as long as several months. This could have drastic effects upon the commercial and sports fisheries of Trinity Bay and the Galveston Bay System.

* * * THE WALLISVILLE COALITION * * *
A GROUP OF HOUSTON-AREA CIVIC ORGANIZATIONS
OPPOSED TO THE CONSTRUCTION OF THE WALLISVILLE LAKE PROJECT

Lone Star chapter of the Sierra Club
Houston Audubon Society
Houston Sportman's Club
League of Women Voters of Houston
Galveston Bay Conservation and Preservation Association
Outdoor Nature Club

Enclosure III

The Importance of Operating Procedures in Determining Yield of Water Sources Available to the San Jacinto Basin, Texas

Daniel P. Sheer, Ph.D., P.E.
Bureau of Reclamation, Washington D.C.

SUMMARY and ABSTRACT

This paper examines the increases in yield available to the San Jacinto Basin (which includes the City of Houston) by joint operation of existing sources of supply. Recent reports detailing the need for additional raw water supply have taken the total available to the city as the sum of the independent yields of its four main sources; ground water, Lake Houston, Lake Conroe, and Lake Livingston. The yields are 337,888 acre feet per year (337 Kafy), 145 Kafy, 98 Kafy, and 1288 Kafy respectively, for a total of 1868 Kafy. The monthly simulation analysis on which this paper is based indicates that the combined yield of all the facilities, operating jointly, may be substantially larger, perhaps by 15 percent or more.

This result is particularly important because two recent reports on water supply in the area have used the sum of the independent yields of the facilities to determine water supply needs for the area. The operating rules which produce the increase in yield are quite simple. Reservoir water is drawn first from Lake Houston, then Lake Livingston, then Lake Conroe. The priority order is derived from comparison of the ratio of storage to drainage for each of the reservoirs. Those with the least storage per drainage are most likely to spill, and are thus drawn down first.

Ground water is pumped at a minimum rate of 150 Kafy (assumed to represent that portion of future demands which can be met by ground water alone), and a maximum of 600 Kafy (the maximum historical pumping rate). Average groundwater pumpage is not allowed to exceed 338 Kafy (the dependable long term yield) for any 10 year period, in an attempt to eliminate further subsidence. Ground water is pumped at the minimum rate unless storage in Lake Livingston falls below levels specified in a simple rule curve. The levels vary by month of the year. When this occurs, groundwater pumping is increased to attempt to reduce withdrawals from the reservoirs, and thus raise Lake Livingston back to the levels specified by the rule curve.

The potential for augmenting yield using high flow skimming on the Brazos river was also examined. Additional yields of 200 Kafy or more seem feasible, even if large minimum flows (for prior rightholders or environmental enhancement) must be left instream.

The operations described in this paper are for the future, not the present. Current demands in the San Jacinto Basin are on the order of 822 Kafy, and thus the conveyance, treatment, and distribution facilities are wholly inadequate for demands on the order of 2000 Kafy. At present, deliveries from Lake Livingston are limited due to lack of conveyance and treatment facilities. Care must be taken that the expansion of the conveyance, treatment, and distribution systems allows for joint operation of supplies. Otherwise, the potential for increased yields will be lost.

Developing fully practical plans for the expansion and operation of Houston's water supply is far beyond the scope of this paper. The preliminary operating policies were designed only to demonstrate the feasibility of increasing yield through joint operation of supplies. Expansion of Houston's conveyance, treatment, and distribution facilities, combined with reasonable operating policies, can supply a large portion of the city's needs for additional supply in the 21st century.

INTRODUCTION

The work described below is the result of an initiative taken by the Water Science and Technology Board (WSTB) of the National Research Council. The WSTB proposed to organize an advisory committee to assist the Federal Agencies involved in Water Resources Management (particularly the Bureau of Reclamation and the Army Corps of Engineers). The focus of the effort was to be improving the operations and management of existing facilities.

While the WSTB's proposal was never formally accepted, it did lead directly to an agreement between the Bureau of Reclamation (BOR) and the author's employer, the Interstate Commission on the Potomac River Basin (ICPRB), whereby the author was placed on temporary transfer to the BOR for the express purpose of exploring alternative operating and management procedures for existing BOR facilities. This is the second in a series of reports resulting from that agreement.

The author would like to express his gratitude to the ICPRB and the BOR for allowing him to pursue this work and the WSTB for its continuing support. In particular, thanks are due Walter Lynn, Yacov Haimes, and Steve Parker of the WSTB, Brent Paul of the BOR, and Paul Eastman of ICPRB for their encouragement and assistance. The author gratefully acknowledges Emily Dowdy of the Southwest Region, BOR, for her assistance in data organization, programming, and analysis. The author also thanks Jerry Wright, Planning Officer of the Southwest region for his advice and encouragement. All responsibility for errors of omission or commission remain with the author.

SETTING

The city of Houston and surrounding areas have historically relied on ground water for their water supply. Growth in the area, explosive at times, has led to pumping of the ground water in excess of natural recharge. This in turn has caused dramatic subsidence, with the loss of land along the coast. Groundwater withdrawals peaked in the early 70's, falling to 463 Kafy in 1988. 1/ This still represents some 38 percent more than the estimated "safe yield" of the aquifer, which is 337 Kafy. 2/

In addition to ground water, the area has three major reservoirs for water supply. Lake Houston is the oldest of the three, with a yield of 145 Kafy from about 180 thousand acre feet (180 Kaf) of storage. Lake Conroe (owned by the San Jacinto Authority) has a yield of 98 Kafy from 430 Kaf of storage. Releases from Conroe flow into Lake Houston where they are withdrawn for treatment. Lake Livingston, on the Trinity River, has a yield of 1290 Kafy. It is a very large lake, with some 1750 Kaf of storage. 4/

The Houston area currently uses some 822 Kafy of water annually. Demands are expected to grow substantially in the first quarter of the 21st century, to perhaps more than 2000 Kafy. Facilities for conveying, treating and distributing the requisite amount of surface water to meet such demands simply do not yet exist in the Houston area. In fact, conveyance of water from Lake Livingston to the Houston area is limited to about one quarter of the safe yield. Because the analyses in this paper deal with demands so much larger than current demands, current conveyance, treatment, and distribution system constraints are ignored. It is assumed that these will be provided as needed.

METHODS AND RESULTS

The objective of the analyses described below was not to precisely define a rule for the joint operation of the sources available in the San Jacinto Basin and Houston area nor to precisely define yields under any operating scheme. Rather, approximate yields under "reasonable" independent and joint rules were compared to demonstrate the potential for increasing yield by coordinating the operations of all sources. This is particularly important because two recent reports on water supply in the area have used the sum of the independent yields of the facilities to determine water supply needs for the area. 2,3/

Independent Yield

To that end, the analysis began by running single reservoir safe yield analysis on Lake Houston, Lake Conroe, and Lake Livingston to establish independent yields. Monthly inflows (1941-1979) were supplied by the BOR Southwest Region from their ongoing San Jacinto study. Reservoir storage (active pool only) data and monthly evaporation data came from the same source. Evaporation was computed as the monthly rate times the full pool surface area. A limit of 8 percent of storage was put on evaporation to avoid negative storages when the reservoirs were nearly empty; This had no practical effect on results.

To avoid questions of ownership in all the reservoirs, the analysis considers the yield of the source for all users. The independent safe yields were in excellent agreement with the yields published in the BOR preliminary findings report for the San Jacinto study, and are given in table 1. The sum of the independent yields of the surface supplies is 1533 Kafy.

A safe yield for the Gulf Coast aquifer within the San Jacinto basin has been developed by the Texas Department of Water Resources. That yield is 337 Kafy. The "yield" of an aquifer is never more than an estimate, and in this case the task of estimating is conpounded by the extension of the aquifer into developed areas beyond the boundaries of the study area. Nonetheless, 337 Kafy was used as a basis for comparing joint and independent yields in an internally consistent manner as described below. The sum of the independent yields of surface and groundwater supplies is 1870 Kafy.

Surface Yield With Joint Operation

A computer program which simulated the joint operation of the surface water reservoirs was developed. The new simulation used the same inflows, evaporation, and reservoir storages as the independent safe yield analysis, but rescheduled the withdrawals. Where the independent yield analysis assumed constant withdrawals from each reservoir, the new simulation released water in priority order; first from Lake Houston, then from Lake Livingston, and finally from Lake Conroe. The priority order was based on the relative probability that each reservoir would refill and spill before the others, thus "losing" water.

The demands placed on the reservoirs varied month-to-month in the same manner as current demands in the San Jacinto Basin. The percent of average annual demand used in each month was supplied by the BOR (Table 2). These percentages were multiplied by an average annual demand to give monthly demands. Small reserves were allowed in the reservoirs to meet local demands and other uses. Small minimum withdrawals were also set for each of the reservoirs. Neither the local demands, reserve storages, nor percentage variation of monthly demands, have a significant impact on system yield.

The demands which could be met by the system, using the joint operating scheme, exceeded the sum of the independent surface yields by about 125 Kafy, an increase of about 8 percent, to a total of 1660 Kafy. The difference is due, in large part, to the disparity in the length of the critical periods for Lake Houston (1 year) and Lake Livingston (4 years). Because of its size, Lake Livingston dominates the joint operating scheme. Its storage is more than large enough to augment flows to Lake Houston during its one critical year. As a result, the critical period on Lake Houston changes from one year to four years. The flows from the San Jacinto basin are completely captured for that period. The average flow in the basin during the 4 year period is substantially larger than the minimum 1 year flow, accounting for the difference in yield.

Yield With Joint Operation of Surface and Ground Water[6]

Next, a provision for incorporating a groundwater pumping rule was made. Again, instead of pumping at a constant rate, equal to the safe yield, provision was made for changing the pumping rate based on levels within the reservoirs. A minimum pumping rate of 150 Kafy (monthly equivalent) was set (arbitrarily) to provide water for those who could not be

economically served by surface water. A maximum pumping rate of 600 Kafy (monthly equivalent) was also set. This corresponds approximately to the historical maximum pumping which occurred in the early 1970's (it has no other basis). Finally, the average pumpage over any consecutive 10 year period was constrained to be less than 337 Kafy, the "safe yield". This was done in an attempt to keep the pumping from causing subsidence due to aquifer drawdown.

The simulation set the pumping rate based on the storage in Lake Livingston. Simulated storage in Lake Livingston was tested against a target storage for that month of year (a rule curve, figure 1). If simulated storage fell below the rule curve, groundwater pumping was increased from minimum to maximum. When storage rose above the curve, groundwater pumping was again set to the minimum level. The rule curve is set to balance:

1) The desire to minimize pumping during non-critical droughts, and

2) The need to start pumping early enough during critical droughts to maximize total pumping during the drought without exceeding the maximum monthly pumping rate.

Inclusion of ground water in the joint operating scheme added some 560 Kafy to the yield of the system, bringing it to 2220 Kafy. If 560 Kafy is looked at as the effective yield of the ground water in the system, it represents an increase over the independent yield of the ground water by more than 60 percent. Total system yield (2220 Kafy) is more than 10 percent greater than the sum of the independent yields. Average groundwater pumping over the 39 year record is only 245 Kafy (less than three quarters of the independent yield). But, the rule is successful in pumping at the maximum rate (600 Kafy) during nearly the entire critical period without violating the constraint that average pumping not exceed the safe yield for any consecutive 10 year period.

Brazos Flow Skimming

Finally, provision for augmenting supply by flow skimming of the Brazos River was added to the simulation model. Historical flows for the Brazos at Richmond were used as the basis for the simulation. These flows do not account for planned depletions, however. In a coarse attempt to account for such depletions, minimum flows were set before pumping could occur. These flows varied month-by-month. For the results reported below, the minimum flows were set at a

300 Kafy monthly equivalent (about 267 mgd) for October - April, and 900 Kafy monthly equivalent (about 800 mgd) May - September. A maximum pumping rate was also set, 240 Kafy monthly equivalent (214 mgd) for the results below.

The operating rule for pumping was quite simple. Water was pumped (up to the maximum rate) whenever it was available in the river (flows in excess of minimums), unless inflows to the reservoirs were sufficient to:

1) Meet all demands with minimum groundwater pumping, and

2) Fill all the reservoirs.

The availability of a 240 Kafy monthly equivalent (214 mgd) flow skimming facility, operated as described, increased the system yield by 180 Kafy, some 75 percent of the facility size. Because the reservoirs are often full, and because there are periods during which flows are not available in the Brazos, average pumping over the period was only 100 Kafy. Increasing the minimum flows to 900 Kafy monthly equivalent (800 mgd) year round decreased the incremental yield to about 50 percent of the size of the facility.

Flow skimming in the Brazos acts to increase yield in a manner inverse to the way in which the rule for ground water works. Where the groundwater pumping rule attempts to use reservoir storage to leave water in the ground for later use, when inflows are small; Brazos pumping makes additional water available by reducing draft on the reservoirs. It then becomes available for use when flows in the Brazos are too low for pumping.

DISCUSSION AND CONCLUSIONS

Because of the approximate nature of the assumptions on flows, demands, and particularly groundwater yields, the above analysis does not provide firm estimates of the yield, or increases in yield that might be had from joint operations of supplies available to the San Jacinto basin. It does, however, show that relatively large increases in yields are possible. System operation should be a major concern in the planning, design, construction, and operation of all future water supply facilities in the San Jacinto Basin.

The operating rules presented above must be modified before they are practical. In particular, the constraints imposed by local demands and existing facilities must be taken into

account. In the case of ground water, location and size of individual wells, and a much more realistic aquifer response, must be considered. Developing practical rules for a given set of facilities will require much more detailed simulation than presented above, including fairly detailed groundwater simulation. This analysis shows that the benefits to be derived from joint operating rules will likely exceed the costs by orders of magnitude.

Potential for increases in yield from joint operation of facilities far exceeds the potential for increases in yield from additional storage in the San Jacinto Basin. Because the length of the critical period is 4 years, and because Lake Livingston will continue to dominate the system, 4 Kaf of storage will provide less than 1 Kafy of additional yield (with evaporation the ratio is likely closer to 5 to 1). The same is true for storage in the Trinity basin above Lake Livingston. This is the marginal return on storage and will decrease as additional storage is built. A 100 Kaf reservoir would thus have an incremental yield of only 25 Kafy.

It should not be concluded that additional storage in the San Jacinto basin is unnecessary. A reservoir in the basin might serve as a reregulating lake for pumpage from the Brazos and/or as a source for a new treatment plant located at a higher elevation in the basin. Such a plant could serve much of the area by gravity -- a decided advantage. Flood control benefits may also accrue. The water supply benefits from new projects in the San Jacinto basin will depend heavily on how they can be used to improve the total system operation rather than only on their independent yield.

In conclusion, the water supply facilities already available to the San Jacinto Basin can reliably supply substantially more than the sum of their independent safe yields. This can only occur, however, if the conveyance, treatment, and distribution facilities, which must be constructed to utilize the water available, are planned and designed to take full advantage of the potential for joint operation.

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2. San Jacinto Project, Texas, Preliminary Findings Report, Department of the Interior, Bureau of Reclamation, Southwest Region, Amarillo, Texas, August 1984, 37 p.

3. Houston Chamber of Commerce, A Water Supply System Plan for the Greater Houston Region. October 1983, 55 p.

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TABLE 1

SAN JACINTO PROJECT ANALYSIS

February 28, 1985

INDEPENDENT SAFE YIELD SUMMARY

Lake Houston	145,000
Lake Conroe	98,000
Lake Livingston	1,290,000
Surface Subtotal	1,533,000
Groundwater	337,000
Sum of Safe Yields	1,870,000

JOINT YIELD SUMMARY

	Total	Increase
Surface Yield (Houston, Conroe, Livingston)	1,660,000	127,000
Surface plus Groundwater	2,220,000	350,000

Yield from New Storage	approx. 1,000 acft/yr per 4,000 acft storage
Yield from Pumping Brazos	50-75% of pipe size for yields to approximately 200,000 acft/yr.

Enclosure IV

IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF TEXAS
HOUSTON DIVISION

CLERK, U. S. DISTRICT COURT
SOUTHERN DISTRICT OF TEXAS
FILED
3-25-86
JESSE E. CLARK, CLERK
BY DEPUTY

SIERRA CLUB)
ENVIRONMENTAL PROTECTION FUND)
HOUSTON SPORTSMAN'S CLUB)
HOUSTON AUDUBON SOCIETY)
TEXAS SHRIMP ASSOCIATION)
CHARLES L. PETING)
EUGENE A. DUTTON)
)
V.) C.A. NO. 71-H-983
)
ROBERT F. FROEHLKE, Secretary)
of the Army,)
LT. GEN FREDERICK J. CLARKE,)
Chief, Corp. of Engineers,)
COL. NOLAN C. RHODES, District)
Engineer)

INTERVENORS:

TRINITY RIVER AUTHORITY OF TEXAS)
THE CITY OF HOUSTON, TEXAS)
COASTAL INDUSTRIAL WATER AUTH.)
OF TEXAS)
CHAMBERS-LIBERTY COUNTIES)
NAVIGATION DISTRICT)

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MEMORANDUM AND ORDER

Before the Court are the Federal Defendants' Motion for Dissolution or Modification of Injunction Under Rule 60(b)(5) FRCP and For Dismissal, and Intervenors Trinity River Authority of Texas, City of Houston, and Chambers-Liberty Counties Navigation District's Motion to Dissolve Injunction wherein all parties are seeking termination or alteration of the injunction of 1973. The Court held a hearing to determine the sufficiency of Defendants' motions, the first segment of 3 days commencing on August 27, 1985 and the concluding portion of 5 days commencing on November 19, 1985. See Sierra Club v. United States Army Corps of Engineers, 609 F. Supp. 1052 (S.D.N.Y. 1985). After careful consideration of the relevant law, the memoranda of all parties, the administrative record, as well as the unusual and complex factual and procedural background surrounding this protracted litigation, the Court is of the opinion that the request by the Defendants and Intervenors should be denied, and that the injunction imposed in 1973 should remain in force until full compliance with the National Environmental Policy Act, 42 U.S.C. §4321, et seq. has been effectuated.

I.

BACKGROUND OF THE LITIGATION

The purposes of the initial authorization by Congress in 1962 to construct the Wallisville project were for salinity

control, water supply, fish and wildlife enhancement, navigation, and recreation. Thereafter, in 1966 the Corps of Engineers (hereinafter referred to as the Corps) began construction.[1] Subsequently, Congress passed NEPA[2] which was to apply retroactively to projects under construction. Sierra Club v. Calloway, 499 F.2d 982, 988 (hereinafter referred to as Wallisville I). As a result, the Corps sought to comply and circulated a DEIS in 1970.[3] However, before a FEIS could be drafted, Plaintiffs filed the lawsuit in Wallisville I seeking to enjoin further construction of the Wallisville project due to claimed NEPA violations. After an extensive hearing and a careful examination of the paucity of law interpreting NEPA at that time, as well as an extensive review of the legislative history of the statute, this Court granted the Plaintiffs' request for an injunction, holding that the EIS was insufficient. See Sierra Club v. Froehlke, 359 F. Supp. 1289 (S.D. Tex. 1973), rev'd and remanded, 499 F.2d 982 (5th Cir. 1974).[4]

The Fifth Circuit reversed certain portions of this Court's ruling but left the injunction intact pending submission of a SEIS on the issues determined inadequate in the original EIS. 499 F.2d at 994. Moreover, the Circuit Court stated that "the Corps need not submit a new impact statement on the Wallisville project, but will submit a revised or supplemental statement. The sufficiency of such statement ... will ... be ... considered on its own merits." Id. "The statement will be

adjudged anew on the basis of its compliance with Sec. 102 tested by its 'good faith objectivity rather than subjective impartiality, ...'" Id., quoting Environmental Defense Fund, Inc. v. Corps of Engineers of the United States Army, 470 F.2d 289, 296 (8th Cir.), cert. denied, 412 U.S. 931 (1972). Moreover, "[o]n another trial plaintiffs will have the burden of establishing their claims by a preponderance of the evidence ..." 499 F.2d at 992. Thereafter, the Corps filed a combined draft EIS-PACR in July, 1979 with the EPA which was circulated to the agencies and individuals.[5]

II.

FACTUAL OVERVIEW AND COURT RATIONALE FOR DENYING DEFENDANTS' PRAYER FOR RELIEF

In the proposed findings of fact and conclusions of law submitted by all Defendants, conclusion of law 22 reads as follows:

> Congress is entitled to legislate on any basis that it desires, and a federal court may not invalidate legislation because it believes Congress acted on erroneous data.

This is a highly unusual case involving NEPA which acquires significance in a number of ways, one of which is the manner in which standard NEPA procedures were not followed by the Corps or the Congress. Although Defendants vigorously contend that their conduct, while admittedly somewhat irregular, meets the required level of statutory procedural integrity to satisfy

any judicial review, the Plaintiffs assert otherwise. They view the above proposed conclusion of law as completely inapplicable to NEPA, a Congressional statute enacted into law in 1969. Instead, it is argued that when Congress passes a law, the Corps and the Congress must abide by it and not subvert its purpose or spirit relevant to environmental concerns. This overview examines the series of events, the legal arguments, and the Court's decision. The balance of the opinion is a section by section analysis of the critical legal issues involved.

When the first of two hearings commenced pursuant to Federal Defendants' Motion for Dissolution or Modification of Injunction, this Court fully anticipated that the evidence would focus primarily on issues concerning whether or not the Corps' EIS-PACR could pass a substantive NEPA review. The Fifth Circuit Court of Appeals had reversed certain portions of this Court's ruling, but left the injunction in place pending submission of a SEIS on the issues found to be inadequate in the original EIS. More specifically, the appellate court felt that a revised or supplemental impact statement would suffice. Corps compliance with NEPA would be tested by good faith objectivity among other legal criteria, and this Court would simply review the evidence to ensure Corps' compliance with all aspects of a NEPA review, including procedural integrity of the agency's consideration of environmental factors addressed in the SEIS.

Pursuant to such mandate the Corps filed a combined draft EIS-PACR in July, 1979, and in accordance with their own internal regulations which were implemented to effectuate NEPA, circulated the document to agencies and individuals for comment. After digesting the comments solicited, the Corps modified the EIS-PACR and forwarded it to the Division Engineer of the Southwestern Division where the conclusions and recommendations were approved. The next step was transmittal of the EIS-PACR to BERH which in March, 1982 forwarded the proposal to OCE. Here certain policy decisions were to be considered. If the original project authorized by the Congress and the newly modified plan were essentially the same, the Chief of Engineers had the authority to reauthorize the project without obtaining Congressional approval again. Here the EIS-PACR languished for a year without approval. In order to aid the Chief of Engineers in determining the scope of his discretionary authority with respect to this project, the OCE requested the Corps to prepare a SIPACR, that is, a document containing supplemental information to the EIS-PACR.

It is at this point that matters became murky, and a departure from normal NEPA procedures occurred. After the SIPACR was prepared by the Corps in July, 1982, it was not sent back for full agency review and comments, and considerable time elapsed. In March 1983, OCE received a legal opinion from its own counsel that it would be improper for the Chief of Engineers to exercise

his discretion and approve the modified project because the SIPACR was new and substantially different from the EIS-PACR.

Meanwhile, Congress had become restless during the delay. Concurrently with the Corps' preparation of the SIPACR in July 1982, the local sponsors of Wallisville were pressuring a prominent local Congressman to obtain approval of the project. Also in March 1983, at about the time the OCE received a legal opinion from its counsel advising against administrative approval of the project, the Congressman was requesting the Energy and Water Subcommittee to include some clarifying language in the 1983 supplemental appropriations bill on the project. In July 1983, Congress passed the bill which contained language referencing and relying upon SIPACR which had never been subject to the NEPA administrative review process in any manner, and the EIS-PACR which remained stalled and only partially processed at the OCE administrative level.

Returning once more to the Corps, it is openly conceded that the SIPACR was never processed pursuant to NEPA requirements. Instead, the Corps has taken the position that SIPACR was an internal document which was for in-house use only, and not subject to the NEPA review. From a review of the record, however, the Court finds otherwise. When asked how the SIPACR made its way to Congress where it was specifically referenced in the supplemental appropriations legislation, the Corps had no answer. It was a mystery. The Corps represented that it had

never anticipated such premature actions by the Congress. The record clearly refutes this position of the Corps and undercuts any contention of its good faith and ignorance of events occurring in Congress. However, faced with an unprecedented accomplished fact--the passage of the supplemental appropriations bill before completion of the NEPA processing--the Corps hastened to conform its administrative actions to the legislation. In relatively short order, a period of some seven months, the SIPACR and EIS-PACR were administratively processed, and the SIR and ROD issued by the end of February 1984.

Congress again took action to appropriate project funds in November 1985. Both the House and Senate Committees on Energy and Water Development utilized similar language and referenced every possible document: the 1981 EIS-PACR, the 1982 SIPACR, the September 1983 FEIS, and the February 1984 SIR. Language "urged the earliest possible completion of the project."

This action to appropriate funds for Wallisville also runs into legal difficulty. Not only is the 1983 Congressional action flawed by reliance on incomplete administrative data in the EIS-PACR and SIPACR; it remains tainted despite post-1983 efforts of the Corps to complete administrative processing of the documents to square with the already enacted legislation. As an alternative position, it is then contended that the same Corps efforts and resulting documents itemized above serve as a valid NEPA basis for the 1985 appropriation, which Defendants now

contend is also a new authorization by implication for Wallisville. Unfortunately, the law does not support this latest position, and the end result is that the requirements of NEPA have never been met in any respect. In sum, Congress simply exceeded its authority and infringed the Corps' sphere while the NEPA process was under way. After ten years of NEPA administrative activity, Congress' premature action in 1983 resulted in interference with the Corps' own internal NEPA procedures which were in the process, although somewhat dilatorily, of being implemented in accordance with the statute. After enacting the environmental law, it is apparent that Congress has declined in this instance to abide by its own legislation. Such an attempt to circumvent its mandate cannot be condoned by this Court. If there is to be judicial approval of this novel course of action to satisfy NEPA, it will have to come from a higher court.

III.

THE CONTENTIONS OF THE CORPS

The Corps takes several positions which it asserts rectify any possible NEPA procedural defects, and constitute adequate administrative compliance with NEPA to buttress and thereby validate subsequent authorization and appropriation of the project by Congress. Curiously, not a single thesis advanced can withstand legal analysis, and the Court is left with no choice but to deny the requested relief and leave the injunction intact until both the Corps and Congress comply with the letter

and spirit of NEPA. The contentions of the Corps in support of its position will now be taken up seriatim.

A.

Corps Actions to 1983 - Congressional Action 1983

It is contended that the explicit 1983 authorization and appropriation of the Wallisville project rest on full NEPA analysis and documentation which permit the Congress to make a fully informed environmental decision and legislate accordingly.

Although the argument can be made that the 1983 Congressional action did not constitute actual authorization of the project, the Court has reviewed the issue and finds to the contrary. There was explicit authorization at that time. However, Congress relied upon and referenced the 1981 EIS-PACR and the 1982 SIPACR as its authority for its statutorily mandated 1983 informed decision. This does not comport with the law, since neither document ever made its way to completion through the NEPA administrative pipeline before being relied upon by the Congress. The EIS-PACR which actually had received full agency scrutiny bogged down at the DCE level where it remained until after the 1983 Congressional action. The SIPACR never had been circulated for any agency or individual review, and constituted nothing more than raw, unprocessed data prior to Congressional action. Actually, this is uncontested by the Corps which sought to characterize the SIPACR only as an internal agency document not for Congressional consideration.

Another point should be made. It cannot even be said that what the Congress prematurely and improperly lifted out of the Corps' administrative stream as authority for its 1983 action on the project was consistent within itself, since the SIPACR was much broader in purpose and constituted a new and substantially different project from that contained in the EIS-PACR. At no point were these differences resolved. Thus, the 1983 Authorization and Appropriation Bill with respect to Wallisville violates NEPA, since the Congress never received from the Corps what the statute impels--a hard look in good faith at the environmental consequences of a proposed action by the agency to permit a reasoned choice among different courses of action.

B.

Corps Actions 1983-1985

It is contended by the Corps that any procedural NEPA defects existing at the time of the 1983 Congressional action were cured thereafter by the Corps administrative action prior to the 1985 appropriation for the Wallisville project.

Once again, it is imperative to bear in mind what Congress intended as the Court's role when NEPA was passed as the law of the land. The purpose of judicial review under NEPA is to ensure the procedural integrity of the agency's consideration of the environmental factors in the environmental impact statement. If that is accomplished, Congress then has before it a striking array of expertise which can be intelligently assessed, and

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utilized in reaching a fully informed and well considered legislative decision.

What happened after the 1983 authorization is without precedent. After Congress prematurely acted in reliance on the statutorily deficient EIS-PACR and unprocessed SIPACR, the Corps did not know what to do. General Dacey so testified. Congress had expressed its will without full NEPA agency input, and in doing so it literally preempted the agency role of the Corps. What occurred thereafter at the Corps level was not to enlighten Congress so that it could enact legislation effectively; rather, it was to square its administrative decisions with the already accomplished Congressional authorization of Wallisville by expediting the process of the incomplete EIS-PACR and SIPACR through the administrative steps to the EPA, and thereafter into the ROD which theoretically documents the Corps recommendation to Congress. By its belated action, the Corps' procedures were meant to comport, at least on paper, with standard NEPA processing patterns. Rhetorically, the question must be asked--how can the Corps under such circumstances perform its NEPA function and make a good faith environmental assessment of the project for Congress to consider when Congress has already made up its mind and independently legislated?

Apparently recognizing possible procedural defects with the supporting NEPA data on which the 1983 Congressional action rests, the Corps now takes an alternative tack. It relies on

the above Corps' action subsequent to the 1983 Congressional authorization to satisfy its statutory good faith investigative role under NEPA for new legislation--the 1985 appropriation. Having assumed this to be so, the embraced rationale of the Corps is that the 1985 Appropriations Act which references all documents for the 1981 EIS-PACR through the 1984 ROD somehow implicitly reauthorized Wallisville, regardless of any past statutory procedural deficiencies.

It takes but a moment to recognize that there is no procedural integrity in this reasoning. There has been no good faith pursuit of the environmental assets and liabilities of Wallisville by the Corps for Congress to consider. Since Congress already had acted in 1983, the Corps, after the fact, was not investigating and advising Congress on environmental matters pursuant to NEPA; it was only setting its own house in order procedurally after the action of Congress had eviscerated the intent of its own statute when it dictated the desired result to the Corps through its premature legislation. To permit this form of agency and legislative legerdemain to succeed is virtually to sound the death knell of NEPA.

C.

Congressional Action - 1985

It is contended that the 1985 Supplemental Appropriations Act is also an act implicitedly authorizing the Wallisville project if it had not been authorized specifically before.

There is a distinction in the law between what constitutes reauthorization of a project, and what constitutes appropriation of a project. Basically, language in an appropriations act cannot serve as substantive legislation unless Congressional intent is clear through an extensive examination of the legislative history. This difference is significant in this case, for the Corps is contending that since Congress has spoken by appropriating funds in 1985, then the need for Court review is foreclosed.

Furthermore, the Corps' assertion that similar language authored by the Senate and House Appropriations Committees and contained in two reports which accompany the Energy and Water Development Appropriation Bill for 1986 exhibits Congressional intent to reauthorize Wallisville by implication, is clearly erroneous. The deficiencies in satisfying NEPA are not cured by annual Congressional recitations appropriating funds for the project. The appropriations bill in 1985 had the specific purpose of merely providing funds for Wallisville which had been specifically reauthorized in 1983, but based on incomplete NEPA documentation. The legislative history of the 1985 bill does not contain language which would indicate that Congress intended the 1985 Act to play the dual role of appropriation and implicit reauthorization of the project. Rather, the language contained in the committee reports, after being carefully scrutinized, does not reflect the intent of Congress to reauthorize the project,

but instead reflects the beliefs and isolated remarks of the committees. Yet, apart from the controlling legal distinction between authorization and appropriation bills, the core deficiency throughout is the fundamental failure of the Corps to adhere to the basic good faith requirements of NEPA before a project reaches the Congress for its consideration.

IV.

FUNCTION OF THE MULTIPLE ACTORS

A. Court Role - Standard of Review

"The purpose of judicial review under NEPA is to ensure the procedural integrity of the agency's consideration of environmental factors in the EIS...." Sierra Club v. Sigler, 695 F.2d 957, 966 (5th Cir. 1983). The Court is not concerned "with the merits of the agency's decision; our concern instead is with the integrity of NEPA-EIS process used to make that decison." Id. at 965. Moreover, this Court must apply a "rule of reason" and not "fly speck" the EIS when determining procedural compliance with NEPA. Citizens of Mass Transit, inc. v. Adams, 630 F.2d 309, 313 (5th Cir. 1980), citing, Lathan v. Brinegar, 506 F.2d 677, 693 (9th Cir. 1974).

Always mindful of what constitutes limited judicial review, the federal courts have the primary responsibility for interpreting the requirements of NEPA. Kleppe v. Sierra Club, 427 U.S. 390 (1976) (Marshall, J., concurring in part and dissenting in part). A court reviewing "an agency decision to go

forward with a major federal action after the agency has prepared and considered an Environmental Impact Statement, ..." Concord Township v. United States, 625 F.2d 1068, 1073 (3d Cir. 1980) (footnote omitted) has "a limited, albeit important," role. Baltimore Gas and Electric, 462 U.S. 87, 97 (1983). The Court must

> ...determine whether all necessary procedures were followed, to consider de novo all relevant questions of law, and to examine the facts to determine whether the decision was arbitrary, capricious, and an abuse of discretion. The reviewing court must adopt that posture because NEPA, while establishing significant substantive goals for the Nation, imposed upon agencies duties that are essentially procedural. NEPA was designed to insure a fully informed and well-considered decision, but not necessarily a decision the judges ... would have reached had they been members of the decisionmaking unit of the agency. Once an agency has made a decision subject to NEPA's procedural requirements, the only role for a Court is to insure that the agency has considered the environmental consequences; it cannot interject itself within the area of discretion of the executive as to the choice of action to be taken.

Township of Springfield v. Lewis, 702 F.2d 426, 441 (3d Cir. 1983) (citations omitted) (emphasis added); see Administrative Procedure Act, 5 U.S.C. §706(2); accord Baltimore Gas & Electric, 462 U.S. at 98, citing Overton Park, 401 U.S. 402, 415-17 (1971); Fritiofson v. Alexander, 772 F.2d 1125 (5th Cir. 1985).

The Fifth Circuit has refined this standard affirming the use of a reasonableness approach which "is clearly a 'more

rigorous standard ... than the rule of arbitrary and capricious review that ordinarily governs agency actions.'" Fritiofson, 772 F.2d at 1238, quoting State of Louisiana v. Lee, 758 F.2d 1081, 1084 (5th Cir. 1985). In applying the reasonableness test, the Court may "receive and weigh evidence beyond that in the administrative record, see Hiram Clarke Civil Club v. Lynn, 476 F.2d 421, 425 (5th Cir. 1973), and should at least satisfy itself that the agency has taken a 'hard look' at the environmental concerns raised by the plaintiffs and the factors made relevant by the various regulations implementing NEPA." Fritiofson, 772 F.2d at 1238, citing Vieux Carre Property Owners v. Pierce, 719 F.2d 1272, 1282 (5th Cir. 1983).

However, an agency decision is entitled to a "presumption of regularity," Overton Park, 401 U.S. at 415, and "[a]dministrative decisions should be set aside ... only for substantial procedural or substantive reasons as mandated by statute ..., not simply because the court is unhappy with the result reached." Vermont Yankee Nuclear Power Corp. v. NRDC, 435 U.S. 519, 558 (1978). Moreover, an agency "decision of less than ideal clarity [will be upheld] if the agency's path may be reasonably discerned." Bowman Transportation, Inc. v. Arkansas-Best Freight System, Inc., 419 U.S. 281, 286 (1974); see Vermont Yankee, 435 U.S. at 551.

In evaluating the adequacy of an EIS to ascertain whether or not compliance with NEPA has been attained, the Fifth Circuit has set forth the following criteria:

> 1) whether the agency in good faith objectively has taken a hard look at the environmental consequences of a proposed action and alternatives;
>
> 2) whether the EIS provides detail sufficient to allow those who did not participate in its preparation to understand and consider the pertinent environmental influences involved; and
>
> 3) whether the EIS explanation of alternatives is sufficient to permit a reasoned choice among different courses of action.

Isle of Hope Historical Association, Inc. v. United States Army Corps of Engineers, 646 F.2d 215, 220 (5th Cir. 1981) (per curiam) (adopting opinion of District Court), citing, Save Our Sycamore v. Metropolitan Atlanta Rapid Transit Authority, 576 F.2d 573 (5th Cir. 1978); Texas Committee on Natural Resources v. Marsh, 736 F.2d 262, 266, reh'g granted in part, 741 F.2d 823 (5th Cir. 1984). In essence, "[o]ur review is therefore limited to the Corps' procedural compliance with NEPA..." South Louisiana Environmental Council, Inc. v. Sand, 629 F.2d 1005, 1013 (5th Cir. 1980). Keeping in mind a court's limited NEPA role when reviewing an agency action, in this unprecedented case involving a Congressional departure from the norm the Court must also recall its primary role within our system of government.

Speaking generally, the American system is one of checks and balances among the Executive, Legislative, and Judicial branches of government.[6] This Court must also assert its watchful eye in accordance with its duty within our system of government. See Marbury v. Madison, 5 U.S. (1 Cranch) 137 (1803); McCulloch v. Maryland, 17 U.S. (4 Wheat.) 316 (1819).

B. Agency Role

NEPA directs "all agencies of the Federal Government" ... to prepare impact statements for "major Federal actions significantly affecting the quality of human environment" ... 42 U.S.C. §4332(2)(c). In other words, NEPA requires federal agencies to consider significant environmental impacts of a proposed project, and to inform the public of the results of their research. Baltimore Gas & Electric Co., 462 U.S. at 89. The duties imposed by the statute are "essentially procedural." Vermont Yankee, 435 U.S. at 558.

NEPA created the Council on Environmental Quality, see 42 U.S.C. §4321; §4372, which has promulgated regulations designed to instruct federal agencies on their role in order to achieve NEPA compliance, as well as to direct federal agencies to enunciate their own regulations. See 40 C.F.R. §1500.2 (1984). Moreover, the courts have held that these regulations are binding on the federal agencies. See State of Louisiana, 758 F.2d at 1083; Sigler, 695 F.2d at 972, citing, Andrus v. Sierra Club, 442 U.S. 347, 356-58 (1979). In complying with the directive of CEQ,

the Corps has implemented its own regulations and procedures to achieve NEPA compliance. See 33 C.F.R. §230.1, et seq. (1985).

C. Congressional Role

By requiring an impact statement under NEPA, Congress wanted to ensure that during the resolution process, the environmental impingements of any action would be considered by all federal agencies. Kleppe, 427 U.S. at 410. Congress in its role as the ultimate decision-making body can endorse and exempt projects from the requirements of NEPA.[7] See Environmental Defense Fund, Inc. v. Froehlke, 473 F.2d at 353; Sierra Club v. Froehlke, 392 F. Supp. 130, 141 (E.D. Mo. 1975), aff'd, 534 F.2d 1289 (8th Cir. 1976). If, however, Congress exempts a project from NEPA, it must do so explicitly within the legislation. See League of Women Voters of Tulsa, Inc. v. United States Corps of Engineers, 730 F.2d 579, 586 (10th Cir. 1984) (concurring, Seymour, J.); see also Navajo Tribe of Indians v. Andrus, 644 F.2d 790 (9th Cir. 1981) (wherein the Circuit Court dismissed the appeal as moot after Congress amended the legislation to specifically exempt the stock reduction mandate from NEPA requirements.) Here, however, Congress never explicitly exempted the Wallisville project from NEPA.

Accordingly, while this Court recognizes that it cannot substitute its judgment for that of Congress, Sand, 629 F.2d at 1013; Sierra Club v. Froehlke, 392 F. Supp. at 141, it is also

clear that NEPA, a Congressional statute, applies with full vigor to Wallisville.

V.

REVIEW OF THE CORPS NEPA PROCEDURE

As is evident from the list contained in footnote 2, NEPA and the Corps have spawned a plethora of acronyms and other alphabetical combinations to identify a number of offices, agencies, reports, and statements employed in processing a given project through the administrative and procedural wickets to ultimate congressional consideration. Following and comprehending the standard procedural steps can be taxing enough to the uninitiated layman; yet, it is the curious departure from traditional process by the Corps and Congress that raises one of the most critical issues in this litigation, a situation which this Court has found in no other reported case. See also Exhibit B.

After the Fifth Circuit reversed and remanded this Court's prior decision, the Corps undertook re-evaluation studies. In July, 1979 the Corps filed a combined EIS-PACR with the EPA.[8] Thereafter, these documents were circulated among various agencies and individuals for comments.[9] Having solicited the comments, the Corps modified the EIS-PACR, and forwarded it to the Division Engineer of the Southwestern Division for further processing.[10] Thereafter, the Division Engineer in Dallas approved the conclusions and recommendations contained in the

EIS-PACR and forwarded the documents to BERH[11] in October 1981.[12] In March 1982, BERH transmitted EIS-PACR to OCE for resolution of policy issues.[13] Specifically, the transmittal was to determine whether or not the Chief of Engineers could reauthorize the project without obtaining Congressional approval.[14] If the projected purposes between the original plan and the modified plan outlined in EIS-PACR were essentially the same, then the Chief of Engineers may have been able to reauthorize the project without Congressional action.

No decision was reached. Instead, in response to requests by OCE, the Corps undertook to prepare the SIPACR dated July 1982,[15] which never was coordinated with any agencies pursuant to NEPA. Certain matters are apparent from the record. After the EIS-PACR had languished in the OCE for over a year,[16] the OCE in March 1983 received a legal opinion from its own counsel as well as one from another department head expressing the view that it would be inappropriate for the Chief of Engineers to exercise his discretionary authority in approving the project.[17]

In the normal course of the NEPA procedure, at this stage, the EIS-PACR would have been filed with CEQ after OCE approval.[18] However, it was at this step that an unprecedented change in direction occurred in the NEPA process. While the EIS-PACR was still under consideration by the Chief of Engineers at OCE, Congress inexplicably intervened and reauthorized the

project[19] in July 1983 in a bill that referenced and relied upon the SIPACR which had never been through NEPA review.[20] At the time of Congressional action, the EIS-PACR was still at OCE and had not proceeded through the entire NEPA process. According to the internal Corps' procedures outlined by General Dacey, the EIS-PACR should have been forwarded to the Assistant Secretary of Army for coordination with the Office of Management and Budget. Thereafter, EIS-PACR would have been ready for Congressional review. As to the SIPACR, the Corps admittedly had not processed that document pursuant to NEPA requirements, a procedure which the Corps now claims was unnecessary since it was an internal document. As will be pointed out hereafter, this was error. The Court has no difficulty from an analysis of its contents and the record in determining that the SIPACR was a SEIS and thereby sufficient to trigger the requirement of full NEPA coordination and processing.

After Congress reauthorized the project in July 1983 based upon the untested SIPACR and the partially processed EIS-PACR, the Corps in an effort to comply with the NEPA process and to conform to Congressional action, expedited the filing of the EIS-PACR with the EPA on September 28, 1983, and solicited comments from the agencies on SIPACR. Based on agency comments obtained only <u>after</u> Congressional reauthorization in 1983, the SIR was prepared and released in February 1984.[21] Subsequently, the Corps reviewed the recommended modifications, and found the

project to be in compliance with the environmental laws and regulations in the ROD dated February 25, 1984.[22]

On November 1, 1985, Congress again took action and appropriated project funds.[23] Both the House and Senate Committees in reports accompanying the Energy and Water Development Appropriation Bill set forth similar statements concerning the Wallisville project. Specifically, the Senate Committee stated:

> ...The Committee believes that the February 25, 1984, record of decision, as supported by the Post-Authorization Change Report (July 1981) [PACR], the Supplemental Information to the Post-Authorization Change Report (July 1982) [SIPACR], the Final Environmental Impact Statement ... (September 1983), [FEIS] and the Supplemental Information Report to the Final Impact Statement (February 1984) [SIR], provide a sound basis for investigation of the environmental impacts of the project and urges the earliest possible completion of the project.[24]

Keeping in mind this Court's function in this intricate maze of facts, the Court now turns to a review of the Corps' procedural actions in light of the legal test set forth in Isle of Hope, and reiterated herein.

VI

CORPS' LACK OF GOOD FAITH

In reviewing the expansive administrative record of some 32 volumes, the record of this hearing, the memoranda of the parties, as well as the applicable regulations, this Court is

compelled to conclude that bad faith existed on the part of the Corps.

The Corps' position as to what precipitated Congress' actions which resulted in the circumvention of the Corps' NEPA process is one of professed ignorance. Specifically, the Corps submits that it, as an agency, did not refer the incomplete documents to Congress.[25] In fact, the record does not reveal how Congress procured the documents prematurely. General Dacey testified that the manner in which Congress obtained the documents was a mystery. Moreover, General Dacey acknowledged that Congress had usurped the agency function and had acted in contravention of the Corps' NEPA procedures. However, defendants' claim of ignorance cannot withstand scrutiny, nor does it comport with its obligations under the law. "The Corps, ... cannot avoid NEPA responsibilities by cloaking itself in ignorance." Fritiofson, 772 F.2d at 1244. The Corps is solely responsible for ensuring total compliance with its own internal NEPA procedures. At the very least, the Corps had a duty to sound the alarm and alert Congress that it was proceeding on untested and fragmentary information, which had not made its way through the NEPA process.

Moreover, as to SIPACR, the Corps argues vigorously that the document was for internal use only, was not a SEIS, and therefore was not subject to NEPA interagency coordination.[26] However, this argument is directly counter to the Corps' actions,

once it was aware that Congress had passed its July 1983 legislation concerning Wallisville in which it specifically relied upon and cited with approval the SIPACR and the EIS-PACR. It was at this point that the Corps scrambled to "get its house in order." For example, the Corps proceeded to file the EIS-PACR with EPA in September 1983, solicited comments on the SIPACR reflected in the SIR,[27] and made its ROD which theoretically documented the Corps' final recommendation to Congress. All of these tardy acts were made in an attempt to square the EIS-PACR, and SIPACR with Congressional action. This is borne out by the testimony of General Dacey who conceded that the Corps was in a quandary as to what to do in view of Congress' premature legislative action before the Corps completed its administrative processing. Since the Corps chose to implement the NEPA procedures on the SIPACR, the Corps cannot now claim that SIPACR is an internal document not subject to NEPA coordination. In essence, "'[b]y its [the Corps] own use of the standards [procedures], it has made them applicable...'" Sigler, 695 F.2d at 966, quoting NRDC v. Calloway, 524 F.2d 79, 85 (2d Cir. 1974). "[I]f the agency follows a particular procedure, it is only logical to review the agency's adherence to that procedure not to some altogether different one that was not used." Sigler, 695 F.2d at 966. Accordingly, this Court is of the opinion and so finds that SIPACR is a SEIS, due both to the Corps' post-Congressional, self-imposed actions, and to this Court's assessment from

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examination of the record that the SIPACR is a SEIS and, therefore, subject to NEPA coordination.

The Corps argues that SIPACR is not a SEIS, while the Plaintiffs assert that the 1982 SIPACR proposes significant changes from the 1981 EIS-PACR, thereby subjecting it to the NEPA process. In essence, Plaintiffs are arguing that SIPACR should have been circulated in draft form so that a good faith look at the environmental consequences could have been achieved before Congressional action.

"In determining whether a supplemental EIS is required, the legal standard is essentially the same as the standard for determining the need for an original EIS." Louisiana Wildlife Federation v. York, 761 F.2d 1044, 1051 (5th Cir. 1985) (footnote omitted). A supplement is required if the project may have significant impacts upon the environment not considered in the original EIS. Environmental Defense Fund, Inc. v. Marsh, 651 F.2d at 992. "'The principal factor an agency should consider in exercising its discretion whether to supplement an existing EIS because of new information is the extent to which the new information presents a picture of the likely environmental consequences associated with the proposed action not envisioned by the original EIS.' The issue is not whether the new information is directly environmental but whether, whatever its nature, it 'raises new concerns of sufficient gravity such that another, formal in-depth look at the environmental consequences of the

proposed action is necessary.' That is, whether it 'provides a seriously different picture of the environmental landscape such that another hard look is necessary.'" Louisiana Wildlife Federation, 761 F.2d at 1051, quoting Wisconsin v. Weinberger, 745 F.2d 412, 418 (7th Cir. 1984)(footnotes omitted) (emphasis added). Moreover, "'it is the initial responsibility of the Corps to apply this standard and decide whether or not a supplemental EIS is necessary. If a party affected by that decision challenges it in court and raises a 'substantial environmental issue,' the reviewing court should uphold the agency's decision only if it is reasonable...'" Louisiana Wildlife Federation, 761 F.2d at 1051-52 , (footnotes omitted).

"[A] party challenging the Corps' decision not to file a [SEIS] has two burdens: First, it must raise a 'substantial environmental issue' ... Second, the plaintiff must show that, with respect to the environmental issue, the Corps did not act reasonably. 'The standard of judicial review is whether the agency decision not to develop an impact statement is reasonable and made objectively and in good faith on a reviewable environmental record...'" Id., (footnotes omitted) (emphasis added). Moreover, in order to raise a substantial environmental issue, the Sierra Club need only show that the project may have significant impacts as opposed to will have significant impacts. See Fritiofson, 772 F.2d at 1238, n.7. Additionally,

> [i]t is clear that a decision to forego preparation of an EIS may be unreasonable for at least two distinct reasons: (1) ... the project may have a significant impact on the human environment ..., or (2) the agency's review was flawed in such a manner that it cannot yet be said whether the project may have a significant impact ... The appropriate relief, moreover, depends upon which of these findings the district court makes.

Id. (citations omitted) (footnote omitted) (emphasis supplied). If the Court makes the former finding, then it is appropriate to order a SEIS. On the other hand, if the latter finding is made, then the Court should remand to the agency. Id.

The Corps' own regulations require a supplement "whenever significant impacts resulting from changes in the proposed plan or new significant impact formation, criteria or circumstances relevant to environmental considerations impact on the recommended plan or proposed action as discussed in 40 C.F.R. § 1502.9(c). A supplement to a draft EIS will be prepared, filed and circulated in the same manner as a draft EIS ... A supplement to a final EIS will be prepared and filed first as a draft supplement and then as a final supplement. Both documents will be filed and circulated in the same manner as a draft and final EIS ..." 33 C.F.R. § 230.11(b)(1985) (emphasis supplied). Moreover, the CEQ regulations provide that a supplement will be filed "if [t]he agency makes substantial changes in the proposed action that are relevant to environmental concerns; or there are

significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts." 40 C.F.R. § 1502.9(c)(1985).

Turning to an analysis of the differences between the EIS-PACR and SIPACR, the Court must make a determination as to whether or not these changes may constitute a significant impact having an effect on the human environment.

Plaintiffs argue that the difference between the 1981 EIS-PACR and the 1982 SIPACR regarding wildlife enhancement[28] is a significant change.[29] Essentially, the EIS-PACR concluded that fish and wildlife enhancement should be deleted as a project purpose, while SIPACR recommended retention of that purpose.[30] As a result, SIPACR evaluated the benefits of that project purpose.

Additionally, plaintiffs contend[31] that EIS-PACR did not analyze a navigation purpose as opposed to SIPACR. Although EIS-PACR found that navigation improvements should be deferred, SIPACR analyzed the project to include navigational benefits[32] for existing and future commercial navigational benefits on the Trinity River. Specifically, SIPACR states:

> ...This report was prepared in response to that request. Whereas the PACR was written as if the Wallisville modifications were a new project requiring a new Congressional investment decision, this supplemental report analyzes the project as a "continuing project" and presents information on the base condition and the without-project conditions. Water supply benefits have been recomputed using current guidance; fish and wildlife

> values have been re-analyzed from a most-likely without-project condition, i.e., total abandonment of the Wallisville Project; navigation benefits attributable to the Wallisville Project have been quantified; and the Wallisville Project and the Liberty Multiple Purpose Channel have been analyzed as a single, multiple-purpose project.[33]

In essance, while "[t]he previous EIS might still be valid in relation to the aspects of the project that have not been changed ... NEPA ... require[s] the supplementation of an EIS when subsequent project changes can, in qualitative or quantitative terms, be classified as [a significant change]." Environmental Defense Fund, Inc. v. Marsh, 651 F.2d at 991. In sum, this Court has made a prior determination that SIPACR is a SEIS and subject to the NEPA process based on the Corps' own internal assessment after the 1983 Congressional action and its application of a SIPACR NEPA review. The Court also finds, based on the applicable law, that Plaintiffs have raised a substantial environmental issue, and that the Corps' decision not to supplement EIS-PACR was unreasonable since the SIPACR sets forth changes in the project that may have a significant impact on the human environment.[34] Therefore, SIPACR should have been designated as a SEIS and subject to NEPA coordination.

Other proof casts the Corps' position in an even more precarious light. Mr. Wooley testified that had the Corps known SIPACR was going to be utilized by Congress, then NEPA coordination would have been effectuated. However, this argument is

squarely refuted by the evidence. In March, 1983 (about four to five months before Congress acted), the Galveston office of the Corps received letters from OCE including its legal counsel advising it that the Chief could not approve the project, as such approval had been determined to be beyond the scope of the Chief's discretionary authority.[35] Counsel's specific views are even more telling. He stated that the desired project changes were so fundamental as to result in a new project "substantially different from the project authorized by Congress." He also observed that "the agency has traditionally returned to Congress for additional authorization in the case of significant project changes."

Even before March, 1983, officials of the Galveston District and the Corps' Southwestern Division (Dallas) prepared a "draft legislation" to be used by Congress in approving the project. This draft dated February 28, 1983 crossed out a reference to an OCE decision on the project, and inserted references to Congressional supplemental appropriations bill.[36] Surprisingly, the incomplete 1982 SIPACR was added to the PACR by handwritten insertion and thereby included in this draft legislation prepared by the Corps as a document to be used by Congress in its forthcoming Wallisville project appropriation in July 1983. While this Court recognizes that the Corps could draft legislation without necessarily proposing that legislation to Congress, see 40 C.F.R. § 1508.17 (1984) (emphasis added), the

Court does not refer to the "draft legislation" for the purpose of establishing that the Corps proposed the 1983 legislation to Congress. Instead, the draft legislation demonstrates that the Corps was using language obtained from "FY 83 Supplemental Appropriation Bill" and, therefore, knew that SIPACR was to be included in the Congressional bill of 1983.

This sequence of events belies the Corps' contention that it did not anticipate Congress' premature actions. Additionally, the Director of Civil Works of the Office of the Chief of Engineers was notified of a Congressman's attempt to secure clarifying language in the 1983 appropriation bill by the Executive Services Manager of the Trinity River Authority,[37] and was supplied with a copy of the Congressman's letter to the Chairman of the Subcommittee on Water Resources. Ironically, the clarifying language referred to in the Congressman's letter to the Chairman of the Subcommittee encompassed the SIPACR, and was identical to the language embodied in P.L. 98-63 of 1983.[38] This language was transmitted to Mr. Wooley of the Galveston District.[39] Accordingly, this Court is convinced that the Corps had prior knowledge of and, therefore, anticipated that Congressional action on a 1983 supplemental appropriations bill was contemplated before the NEPA process was completed by the Corps.

In sum, the Corps knew SIPACR was intended for Congressional use; yet when Congress somehow acquired the documents from the Corps NEPA process prematurely, the Corps did nothing

but claim surprise and ignorance. Then, following enactment of the appropriations bill of 1983, in an effort to comply pro forma with NEPA and appear consistent with previous Congressional action, the Corps conducted post-approval procedures. All of these actions point toward a lack of good faith on the part of the Corps. As a result, the Corps has failed to satisfy the first prong of the test outlined in Isle of Hope, 646 F.2d at 220. The Corps did not take a hard look at the environmental consequences in good faith objectivity. Instead, it abdicated its function which was to ensure under NEPA that Congress receive an adequate environmental impact assessment on which it could base its action.

VII.

CONGRESSIONAL ACTION 1983 VS. 1985

In 1983 Congress reauthorized the modified plan outlined in the EIS-PACR referencing SIPACR. Specifically, Pub. L. 98-63 (1983), entitled "Supplemental Appropriations Act, 1983" states:

> The Wallisville Reservoir, Texas, project, authorized by section 101 of the River and Harbor Act of 1962 (Public Law 87-874), is hereby modified with respect to its physical elements and planned operation as recommended in the Wallisville Lake, Texas, Post-Authorization Change Report, July 1981, as supplemented, July, 1982.

Moreover, the Committee report to the 1983 Congressional action stated:

> Wallisville Lake, Texas - The committee notes that the Fiscal Year 1983 Supplemental Appropriations Bill provides necessary authorization authority for the Wallisville Lake project...

See Vol. 1, pg. 21.

In 1985, Congress appropriated funds for the Wallisville project. In two reports accompanying the bill and authored by the Senate and House appropriations committees, similar language was inserted which referenced NEPA documents. Specifically, the Senate Committee stated:

> ... The committee believes that the February 25, 1984, record of decision, as supported by the Post-Authorization Change Report (July 1981), the Supplemental Information to be Post-Authorization Change Report (July 1982), the Final Environmental Impact Statement ... (September 1983), and the Supplemental Information Report to the Final Impact Statement (February 1984), provide a sound basis for investigation of the environmental impacts of the project and urges the earliest possible completion of the project.

S.R. Rep. No. 110, 99th Cong., 1st Sess. (1985).

In Andrus v. Sierra Club, 442 U.S. 347, 359 (1979), the Supreme Court reiterated and acknowledged the Congressional

distinction between "legislation" (authorization) and "appropriation" citing the Comptroller General's published definitions. Specifically, "authorizing legislation" is defined as:

> "Basic substantive legislation enacted by Congress which sets up or continues the legal operation of a Federal program or agency either indefinitely or for a specific period of time or sanctions a particular type of obligation or expenditure within a program. Such legislation is normally a prerequisite for subsequent appropriations or other kinds of budget authority to be contained in appropriations acts. . ."
>
> Appropriations, on the other hand is defined as: "An authorization by an act of the Congress that permits Federal agencies to incur obligations . . . An appropriation usually follows enactment of authorizing legislation . . ."

Id., at 359-360, n.18. The Court went on to state that "... appropriations ... 'have the limited and specific purpose of providing funds for authorized programs.'" Id., at 360, citing, TVA v. Hill, 437 U.S. 153, 190 (1978). Moreover, "... the ... provisions of NEPA are directed precisely at the processes of 'planning and ... decisionmaking,' [and, therefore,] are associated with underlying legislation ..." Id. (citations omitted).

Essentially, the distinction drawn between authorizing legislation and appropriations acts is that appropriations acts generally cannot serve as a vehicle of substantive legislation or as a ratification of prior agency action. See City of Los Angeles v. Adams, 556 F.2d 40, 48 (D.C. Cir. 1977); Environmental

Defense Fund, Inc. v. Froehlke, 473 F.2d at 354-55; Sierra Club v. Froehlke, 345 F. Supp. 440, 446 (W.D. Wis. 1972), aff'd, 486 F.2d 946 (7th Cir. 1973). As a general rule, appropriations acts do not affect substantive legislation. See United States v. Vulte, 233 U.S. 509, 514-15 (1914), and cannot be construed as implicit authorization of projects. See, e.g., Greene v. McElroy, 360 U.S. 474, 505 (1979); D.C. Federation of Civic Associations v. Airis, 391 F.2d 478, 481-82 (D.C. Cir. 1968). However, "[c]ongressional approval or authorization may be found in . . . appropriations statutes, so long as it is demonstrated that Congress had knowledge of the precise action or project at issue and was explicitly and specifically addressing that project." Sierra Club v. Andrus, 610 F.2d 581, 601 (9th Cir. 1979), rev'd on other grounds, 451 U.S. 287 (1981) .

In essence, the resolution of the issue of whether an appropriations measure constitutes authorization depends on the factual background of each case. See Libby Rod and Gun Club v. Poteat, 594 F.2d 742 (9th Cir. 1979). The Court, in reviewing the background of each case, must look to the legislative history to ascertain Congressional intent in determining whether the appropriations bill is authorization of the project. See Sierra Club v. Andrus, 610 F.2d at 602 (wherein the Court looked to the legislative history which reflected that Congress knew that a specific facility was a part of the project, thereby authorizing the facility in an appropriations bill). Further, any time an

argument is made that an appropriations bill is authorization, the committee reports should be closely scrutinized. See Sierra Club v. Andrus, Id. at 609, n.1 (citations omitted) (Tang, J. concurring). For example, the Court should be "...hesitant, as was the Supreme Court in TVA v. Hill, to interpret isolated remarks in committee hearings or reports as expressions of the intent or knowledge of Congress." Poteat, 594 F.2d at 746. See also Montgomery v. Ellis, 364 F. Supp. 517, 532 n.7 (N.D. Ala. 1973) (wherein the Court observed that Congressional committees could not exercise legislative powers which were within the realm of Congress itself under the Constitution).

In the case at bar, Defendants contend that the 1983 and 1985 appropriations bills provide the necessary authorization for the Wallisville project, either explicitly in 1983 based on the Appropriations Committee report attached to the bill, and/or implicitly in 1985 based on the language referencing the NEPA documents.

While this Court acknowledges that the language contained in the Committee report to the 1983 Congressional action[40] reauthorizes as a matter of form the Wallisville project, even though fatally flawed by being based on the incomplete NEPA documents (EIS-PACR and SIPACR), the Court does not agree that the Senate and House Appropriations Committees' language referencing all of the NEPA documents in 1985 provides authorization for the project. A review of the legislative history of the 1985

bill does not indicate that the 1985 bill was intended as a reauthorization of Wallisville.

In sum, Congress, in 1983, authorized a project based on incomplete NEPA documents. Therefore, in 1983, Congress was not statutorily fully informed and could not make a well-considered decision as mandated by the very purpose of NEPA. Thereafter, in 1985, some nineteen months later, Congress attempted to rectify its mistake (the obtaining of fragmentary NEPA documentation by its own actions in violation of its own statute) by claiming to be fully informed given the documents that had purportedly completed NEPA process between the 1983 Congressional authorization bill and the 1985 Congressional appropriations bill. However, after careful review of the applicable law, this Court holds that the 1985 appropriations act referencing the "completed" NEPA documents which enabled Congress to make a fully informed "decision" was not a substitution for the 1983 authorization, and did not remedy the fatal defect in the 1983 legislation. The 1985 appropriations act merely was funding for the Wallisville project that previously had been authorized in 1983 based on incomplete documentation that had not proceeded through the NEPA process. Therefore, the 1985 appropriations act did not authorize the Wallisville project based on the array of NEPA documentation referenced therein.

After careful review of the Committee hearings, there is no indication that the 1985 Congressional action was intended

to be anything other than an appropriation of funds. The end result is that this Court is faced with a project that has been authorized by legislation (1983) which was based on inadequate NEPA documentation. This defect has never been corrected, and NEPA, accordingly, has never been satisfied.

VIII.

CONCLUSION

This Court recognizes only too well that protracted litigation in environmental cases can kill projects by delay. It has been thirteen years since this Court imposed the current injunction, and it certainly was anticipated when the most recent hearings commenced that the evidence would reflect a thorough and detailed NEPA review consistent with the dictates of the Fifth Circuit Court of Appeals. What has emerged instead is a tortuous, time consuming procedural record of the interaction of the Corps and Congress on Wallisville. It is replete with instances of Corps' bad faith which flouts as well the environmental safeguards built into NEPA for Congress to adhere to in passing environmental legislation. These are not minor matters which can be excused on the grounds that to hold contrary to the Corps would be exalting form over substance. Indeed, they go to the very core and meaning of NEPA.

Another major concern of the Court is a prompt major resolution of this litigation pursuant to existing law so that there will be no further delay in the overall surface water

availability for Houston and its environs as well as benefits for the other sponsors of the project. But the latest legal quagmire precludes any consideration of these matters until the law is properly applied. One wonders why, if the professed benefits of this project are so obvious, a simple course of action which complied with NEPA was not followed to the letter, thereby eliminating all of this fruitless waste of time and legal expense.

It takes but a moment's reflection to recognize the Court's dilemma in fashioning a course of action for the Corps to follow while the injunction remains in place.

With NEPA as a federal statute having been turned askew by virtue of aberrant Congressional action on Wallisville before the Corps' procedures had been completed, it may be exceedingly difficult for the Corps to commence anew and exercise its statutory good faith environmental investigative role without feeling totally intimidated by the Congress which has already made up its mind and legislated. Yet, the Court has no other choice. It cannot accept any of the Corps' positions heretofore analyzed in this opinion, since they are statutorily and legally untenable.

Therefore, the Corps will complete the full processing of the 1981 EIS-PACR, and will process the 1982 SIPACR through all aspects of the NEPA administrative review including the obtaining of agency and individual input so that a bona fide

record of decision ultimately can be presented to the Congress for its consideration. In brief, the Corps will re-commence the administrative process at the time when the first departure from standard NEPA procedures occurred prior to the 1983 legislative action. In the interim, the injunction will remain in place pending full compliance by the Corps with NEPA.

SIGNED AND ENTERED at Houston, Texas, on this the 25th day of March, 1986.

United States District Judge

[1] Vol. 1, pg. 23; Vol. 2, pg. 336; Vol. 3, pg. 898. All references hereinafter are to the administrative record.

[2] For a quickhand reference to the chronological sequence of events, see Exhibit "A." Moreover, for purposes of this opinion, the following abbreviations will be used:

NEPA - National Environmental Policy Act
CEQ - Council on Environmental Quality
BERH - Board of Engineers for Rivers and Harbors
OCE - Office of Chief of Engineers
EPA - Environmental Protection Agency
USFWS - United States Fish & Wildlife Service
NMFS - National Marine Fisheries Service
FWCA - Fish and Wildlife Coordination Act
WRC - Water Resources Council
EIS - Environmental Impact Statement
PACR - Post-Authorization Change Report
FEIS - Final Environmental Impact Statement
DEIS - Draft Environmental Impact Statement
SEIS - Supplemental Environment Impact Statement
SIPACR - Supplemental Information to the Post-Authorization Change Report
SIR - Supplemental Information Report
ROD - Record of Decision
SOF - Statement of Findings

[3] Vol. 2, pg. 336; Vol. 2, pg. 334.

[4] Id.; Vol. 3, pg. 898.

[5] Vol. 2, pg. 338. There is a dispute as to whether the project is modified or new, and whether the statement is revised or supplemental. General Dacey testified that the project was modified. See Vol. 1, pg. 23. Further, the Corps submits that the EIS-PACR is new, as opposed to a revised or supplemental statement which would have been condoned by the Circuit had it passed NEPA scrutiny. In any event, whatever label is given the EIS-PACR filed, as directed by the Circuit, this Court will adjudge it anew.

[6] For a comprehensive review of the development of the theory of separation of powers, see W. B. Gwyn, The Meaning of the Separation of Powers (Tulane Univ. 1965); M. J. C. Vile,

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Constitutionalism and the Separation of Powers (Clarendon Press 1967); Sharp, The Classical American Doctrine of "the Separation of Powers", 2 U.Chi.L.Rev. 385 (1935). Cf. Nixon v. Administrator of General Services, 433 U.S. 425, 443 (1977) (footnote omitted) wherein the majority opinion stated:

> Like the District Court, we therefore find that appellant's argument rests upon an "archaic view of the separation of powers as requiring three airtight departments of government..."

quoting Nixon v. Administrator of General Services, 408 F. Supp. 321, 342 (D. D.C. 1976).

7 See Harrington v. Bush, 553 F.2d 190 (D.C. Cir. 1977).

8 Vol. 2, pg. 338.

9 Comments were solicited from various organizations such as Sierra Club, Houston Audubon Society, Houston Sportsman's Club, Texas Shrimp Association, National Marine Fisheries Service, National Parks Service, Environmental Protection Agency, Fish and Wildlife Service, Wildlife Management Institute, as well as agencies of the State of Texas. See, e.g., Vol. 1, pg. 206-334; Vol. 4, pg. 1391, et seq.

10 Vol. 2, pg. 344.

11 Id.; BERH is comprised of a review team consisting of a project manager, economist, and environmentalist who make an initial assessment of the documents by making a site visit, conferring with the field staff, and ultimately preparing memoranda and working papers for the Board. Vol. 7, pg. 2552. Thereafter, the staff prepares an analysis which has no binding effect on the BERH's findings. Moreover, in making its findings, BERH applies the Corps of Engineers' policy in a uniform manner across the country. Testimony of Mr. Wooley.

12 Vol. 2, pg. 338.

13 Id.; Testimony of Mr. Wooley.

[14] See Vol. 6, pg. 1946-47. Cf. Vol. 6, pg. 2169 wherein the summary of SIPACR states that the project authorization was within the Chief's discretionary authority, as opposed to the letter addressed to the Commander of the Corps from the Corps lower division advising that it would be inappropriate for the Chief to exercise his discretionary authority in approving the project. While these divergent statements have no direct bearing on this Court's decision, it does reflect the confusion and contradiction of the Corps during the NEPA processing of Wallisville.

[15] Id.

[16] See Vol. 6, pg. 2163.

[17] See Vol. 6, pg. 2176 and Vol. 6, pg. 2169.

[18] See Defendants' Exhibit 28. for a quickhand reference of the Corps' procedures, see Exhibit "B" attached herein.

[19] Supplemental Appropriations Act, 1983. Pub. L. No. 93-63, 97 Stat. 301, 311 (1983).

[20] The Corps concedes that SIPACR's findings were developed without NEPA agency coordination. Vol. 1, pg. 193.

[21] Vol. 1, pg. 27.

[22] Vol. 1, pg. 23-26; the record of decision is the final recommendation by the Corps on a project requiring an EIS prior to Congressional action. See 33 C.F.R. 230.12 (1985).

[23] Although the Corps acknowledges this Court's limited review power under NEPA, the Corps argues that Congress' legislative action forecloses the need for Court review. Essentially, the Corps argument is "...that review on the merits is not proper in this case because Congress appropriated money for the project ... [and] that the decision of Congress to fund the project ... makes the decision ... a Congressional one not subject to review by the Courts." Environmental Defense Fund, Inc. v. Froehlke, 473 F.2d at 353. While this Court has no

intention of supplanting Congressional decisions, this Court will review for compliance with NEPA since "... an appropriation act cannot change the requirements of NEPA." Id. at 355. See James River Flood Control Association v. Watt, 553 F. Supp. 1284, 1296 (D. S.D. 1982).

24 Defendants' Exhibits 24, 26, 27; H.R. 195, 99th Cong., 1st Sess. 37 (1985); S.R. Rep. No. 110, 99th Cong., 1st Sess. (1985).

25 See Defendants' and Defendant-Intervenors' Post-Trial Brief. Without specifically stating, the implication of the Corps' argument is that its hands were clean, and if there was any misconduct, it was on the part of Congress.

26 The record is replete with references to SIPACR as a supplement. See, e.g., Vol. 1, pg. 23; Vol. 2, pg. 335.

27 As further evidence of the Corps' bad faith, no true interagency consultation was effected in the formulation of SIPACR. To date, the Corps has not sought to consult or coordinate with the NMFS despite the agency's request. Testimony of Don Moore; Vol. 1, pg. 183; Plaintiffs' Exhibit 10. Cf. the ROD where General Dacey states that agency coordination took effect on September 21, 1983. Vol. 1, pg. 25.

28 The 1981 EIS-PACR documents reported annual losses of $989,000 while the 1982 SIPACR documents reported $122,000 enhancement value annually. Vol. 2, pg. 346; Vol. 2, pg. 338.

29 The NMFS and other agencies have considered this a significant change. Testimony of Don Moore; Vol. 1, pg. 191.

30 Although the Plaintiffs point out more differences than fish and wildlife and navigation between the 1981 and 1982 documents, for purposes of ascertaining whether SIPACR is a SEIS, the Court will discuss these two purposes, only.

31 In a nutshell, Defendants are contending that any difference between the 1981 documents and the 1982 SIPACR is merely an economic change, and not an environmental change. In other words, even though the 1981 document did not quantify impacts, it did qualify them, and any changes are merely quantification of

previously recognized impacts. Therefore, Defendants argue, since no "significant impacts resulting from changes in the proposed plan," see 33 C.F.R. §230.11(b) (1985), or no "significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts," see 40 C.F.R. §1502.9(c) (1985) occurred, SIPACR is not a supplemental EIS subject to NEPA coordination.

32 Vol. 2, pg. 353.

33 Vol. 2, pg. 344; Vol. 2, pg. 353; Vol. 2, pg. 359.

34 The administrative record indicates that SIPACR made substantial and significant changes to the project. See Vol. 6, pg. 2176.

35 Vol. 6, pg. 2169; Vol. 6, pg. 2176. Further, Mr. Wooley testified that, under Corps' procedures, if the Chief could not act to approve the project, then the remaining approval forum was Congress.

36 Vol. 6, pg. 2180-81.

37 Vol. 6, pg. 2157; Vol. 6, pg. 2162-63.

38 Vol. 6, pg. 2158; Vol. 6, pg. 2147.

39 Vol. 6, pg. 2159.

40 Vol. 1, pg. 21.

EXHIBIT "A"

CHRONOLOGY

1962	Congress authorizes construction of 19,700 acre Wallisville Lake Project. PL 87-874.
1966	Corps commences construction of Wallisville project.
1969	Congress passes NEPA.
1970	Corps circulates a draft Environmental Impact Statement (EIS) for the Wallisville project.
1971	Sierra Club files suit to enjoin project. CA 71-H-983.
1973	District Court enjoins construction of project in a summary judgment.
1974	Fifth Circuit reverses and remands decision of trial court but injunction remains intact pending supplemental study.
1974-79	Corps undertakes reevaluation studies and proposes modifications to the project.
July 1979	Corps circulates draft Post-Authorization Change Report (PACR) and EIS that recommends the modified 5,600 acre project.
July 1981	Corps circulates draft final PACR and EIS.
October 1981	PACR and EIS forwarded to Board of Engineers for Rivers and Harbors (BERH) for comment.
March 1982	BERH sends PACR and EIS to Office of Chief of Engineers (OCE) for resolution of policy issues.
March 1982	OCE requests Galveston Division to prepare supplemental information to resolve policy issues raised by BERH.

July 1982	Galveston District (Corps) prepares an internal document entitled Supplemental Information to Post-Authorization Change Report (SIPACR) and submits it to OCE.
July 1983	Congress reauthorizes modified Wallisville project, relying in part on SIPACR.
Sept. 1983	SIPACR attached to PACR and released to the public and interested agencies for review and comment.
Feb. 1984	Corps prepares Supplemental Information Report (SIR) including the Corps' responses to comments on the final EIS and SIPACR.
Feb. 25, 1984	General Dacey signs Record of Decision (ROD) approving the Wallisville project.
Nov. 1985	Congress again appropriates funds on the Wallisville project after reviewing all of the Wallisville project documents including the SIR and ROD.

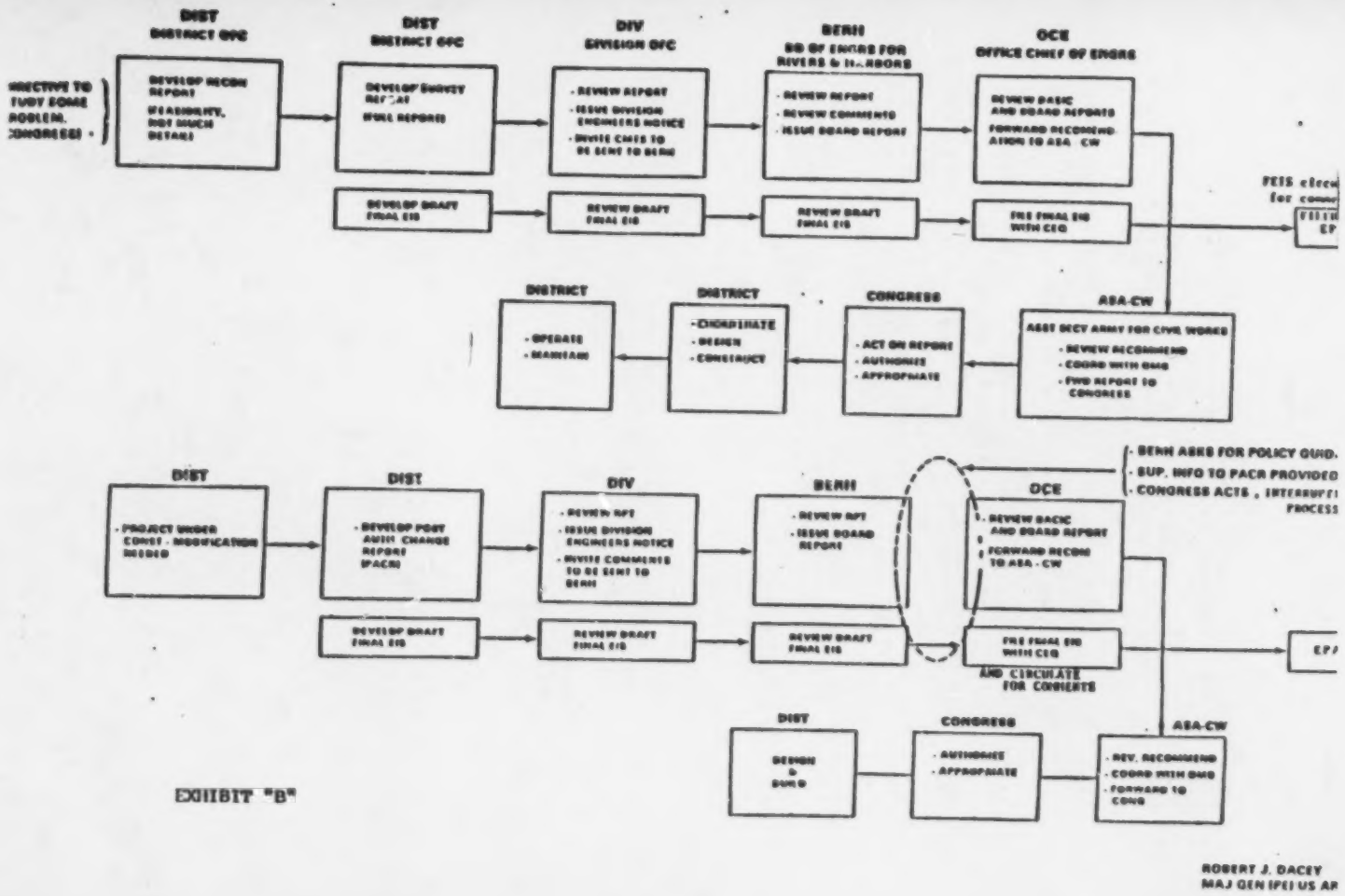

EXHIBIT "B"

ROBERT J. DACEY
MAJ GEN (PE) US AR

Mr. GILLEN. We support Galveston District stated capability of $100,000.

In conclusion, the Authority again expresses its appreciation for the opportunity to testify before this body. TRA sincerely appreciates the Federal dollars that remain available for the people of the Trinity River basin.

Thank you.

[The statement of Mr. Gillen follows:]

STATEMENT OF THE

TRINITY RIVER AUTHORITY OF TEXAS

TO THE

SUBCOMMITTEE ON ENERGY & WATER DEVELOPMENT

COMMITTEE ON APPROPRIATIONS

APRIL 9, 1986

Mr. Chairman & Members of the Subcommittee:

I am Blake Gillen of Corsicana, Texas. I am a member of the Board of Directors of the Trinity River Authority of Texas (TRA) representing Navarro County and currently serve as the Authority's President of the Board.

TRA endorses and requests your support for the funding recommended in the Administration's FY 1987 budget for those projects we support as local sponsors.

JOE POOL RESERVOIR

We are pleased to report to you that the Fort Worth District of the U.S. Army Corps of Engineers began the intentional impoundment of water in Joe Pool Lake on January 7, 1986. TRA supports the recommended FY 1987 appropriation of $9.7 million for the continuation of construction on this most important water project. As the water level rises, the public demand for recreation access to Joe Pool Lake will increase commensurately. Facilities to allow for access will only become available through appropriations made for 1987 and a few years beyond.

For the record, TRA is in the process of completing $4.8 million in Authority funded construction on an intake structure that will allow for the withdrawal, treatment and distribution of the water supply contained in Joe Pool Lake. The public will be able to benefit from Joe Pool Lake in terms of water supply, recreation and flood control with this Committee's continuing support for construction funding.

TRINITY RIVER PROJECT

A total of $200,000 has been recommended to enable the Corps' Fort Worth District to continue with advanced engineering and design on the navigation to Liberty component of the Trinity River Project. Navigation to Liberty is only possible today as the result of substantial federal dredging and snag removal efforts within the existing Trinity River channel. The completion of plans for the development of a multiple-purpose channel to the existing Port of Liberty would provide a blueprint for making navigation much more reliable as well as enhancing the entire region's economic prospects.

BEDIAS RESERVOIR

The need to evaluate additional water supplies to provide for future needs within the lower Trinity River basin and along the upper Gulf Coast of Texas becomes a more pressing reality every year. An appropriation of the recommended $1.6 million will enable the U.S. Department of the Interior's Bureau of Reclamation to continue their studies of a potential Bedias Lake. We urge your continuing support for this important federal study effort.

WALLISVILLE

Since our last appearance before you, we have participated in two weeks of trial in Federal District Court in Houston. Just ten days ago the Court ruled that NEPA procedures were violated by Congress when the Committee authorized the modified project in 1983. Judge Bue said in his 43 page opinion "...Congress, in 1983, authorized a project based on incomplete NEPA documents. Therefore, in 1983, Congress was not statutorily fully informed and could not make a well considered decision as mandated by the very purpose of NEPA."

The Corps of Engineers has expressed a $100,000 capability so design of the project can continue. We ask your support so that design can continue while we sort out the legal remedies.

OPERATIONS AND MAINTENANCE

The Corps of Engineers has requested, and TRA strongly endorses, appropriations for operation and maintenance funds in the following amounts for the projects we currently support as local sponsor:

Project	1987 Amount
Bardwell Lake	$ 743,000
Joe Pool Lake	351,000
Navarro Mills Lake	855,000
Wallisville Project	$ 205,000

CONCLUSION

The Authority again expresses its appreciation for the opportunity to testify before this body. TRA sincerely appreciates the federal dollars that remain available for the people of the Trinity River basin.

Mr. PERRY. Our next speaker is Annette Strauss, Mayor Pro-Tem for the City of Dallas.

Ms. STRAUSS. Mr. Chairman, members of the committee, my name is Annette Strauss, and I am Mayor Pro-Tem for the City of Dallas. Let me express my appreciation as well as that of Mayor Starke Taylor and the City Councils of Dallas and Denton for your committee's continued support for the Ray Roberts Lake project.

My testimony today is presented on behalf of the Cities of Dallas and Denton who are cosponsors of this project and have contracted with the Corps of Engineers for the design and construction of this project in order to obtain a water supply of 76 million gallons per day.

As you are aware, the Dallas-Denton-Fort Worth area has experienced rapid growth in the last few years. This project is a necessary means to service this growth and to provide a source of water supply, recreation, and flood protection for its citizens.

Since we last appeared before this committee in April 1985, construction of the dam and outlet works has progressed satisfactorily; and the Corps has advised us that deliberate impoundment is scheduled for July 1987.

The Cities of Dallas and Denton request that President Reagan's 1987 budget allocation for the Ray Roberts Lake project be accepted and supported by this committee. Funding requested includes $345 million for continued project construction and $136,000 for operation and maintenance of the reservoir.

With your approval of this funding, the project can remain on schedule and construction of the dam, road and railroad relocations, design of recreational facilities, and land acquisition can continue.

Any cutbacks could mean a delay in the timely completion of this project which could hamper us greatly in meeting the water needs of our region. Also, as you know, when the project is completed, the local sponsors will begin repaying, with interest, the money advanced by the Federal government. Any delay in this project will of course delay that repayment.

I urge your careful consideration of the Administration's budget request for full funding for the Ray Roberts Lake project. I look forward to your continued cooperation in this important matter.

Thank you very much.

Mr. PERRY. Thank you, Mayor. Our next speaker is Greg Patton, president of the Joe Pool project.

Mr. BEVILL. You named the lakes Joe Pool and Ray Roberts, which didn't hurt a thing here, Mr. Perry. Two very outstanding Members of Congress.

Mr. PERRY. First year Ray has not been able to be with us.

Mr. BEVILL. That is right. He is usually here.

Mr. PATTON. Thank you. Mr. Chairman, and members of the subcommittee, my name is Greg Patton and I am speaking today as president of the Joe Pool Lake Planning Council. We are an ad hoc citizen group that has supported Joe Pool since before it was authorized for construction by Congress in 1965. As a result of the foresight demonstrated by this committee, the Planning Council's job is almost done.

You have heard from Martin Frost who outlined the expression project on it. I would like to express my appreciation to Martin for his help. He has done a fantastic job. Our only concern is the public's demand for recreational access to Joe Pool Lake has already begun, and we have been informed that the first public facilities to allow for this access will not be available until the middle of 1988. The proposed appropriations of $9.7 million for fiscal year 1987 will include money for recreation facility construction. We fully anticipate that as the lake level rises, pressure for access will increase commensurately. We, therefore, strongly support the proposed appropriation for fiscal year 1987 as the only means of relieving this pressure.

I would like to extend to you a personal invitation to our dedication on May 24. You have been with us many years and we appreciate it very much.

Thank you.

Mr. BEVILL. Thank you very much. If I can I would be glad to. Usually it is pretty hard for me to.

Mr. PATTON. We will have all-day preaching and real Texas barbecue.

Mr. BEVILL. Sounds like my kind of meeting.

Mr. PATTON. Thank you very much.

Mr. PERRY. Our next speaker is Homer Smith, Manager of the Port of Liberty.

Mr. SMITH. Mr. Chairman, and committee members, my name is Homer Smith and I currently serve as manager of the Liberty-Dayton Area Chamber of Commerce and Director of the Port of Liberty. Today I am the spokesman for the City of Liberty and the lower Trinity River region in general.

Our Port of Liberty is located at Trinity River mile 45 and has been usable only during periods of extremely high river rises for the last eight years. You demonstrated faith in our request and appropriated the necessary funds to dredge our river. For this we are deeply appreciative.

We are happy to state that, through cooperation and communication between all entities, excellent results have been achieved. The progress to date would not have been possible without tireless efforts by this committee, the House and Senate, the Corps of Engineers, the Trinity River Authority, the Chambers-Liberty Counties Navigation District, the City of Liberty and the Port of Liberty. Many leading local businessmen and landowners took an active part in securing the necessary easements. Never before in the history of this river project have so many easements been required and secured. Most active in this effort was former Senator Price Daniel.

The Corps of Engineers issued a contract in August to dredge the six-foot channel. The dredging is over 50 percent complete at this time. We are happy to report that Mississippi Chemical Company has already been utilizing the port.

Because of this water-way, we have been advised of the availability of future customer tonnage on the river. Some of these are Mississippi Chemical, Exposaic Wire Company, National Pipe and Tube and local aggregate material suppliers. We have also begun

to spread the word about our facilities to potential industries throughout the U.S. and some foreign countries.

Our work has just begun. We have dedicated ourselves to keeping the channel open, and it is our hope that the Corps will strive to routinely provide the resources to assure an open channel for commercial traffic.

The Galveston District of the Corps of Engineers has advised us that the sufficient funds are available to complete present dredging, so a line item appropriation for this purpose will not be required for fiscal year 1987. However, funds for this most essential purpose will be required in future years if this commercial lifeline is to remain viable for industry.

Our ultimate goal is for the construction of a nine-foot multi-purpose channel to Liberty. We request your support for the $200,000 appropriation for advanced engineering and design efforts on the Navigation to Liberty.

We also continue our support for the Wallisville project in the amount of the Corps expressed capability of $100,000 for continued design. When a favorable court decision is received, we ask that the Corps of Engineers be funded so that construction of this much needed project can begin.

From all of us on the Lower Trinity, please accept our sincere thanks for your continued interest and support.

Mr. BEVILL. Very good.

Mr. PERRY. Our next speaker is Ms. Carol Dinkins, representing the Houston Chamber of Commerce.

Ms. DINKINS. Mr. Chairman, members of the committee, for the record my name is Carol Dinkins. I am with Vinson and Elkins in Houston. I am here today speaking on behalf of the Houston Chamber of Commerce.

Houston looks towards the Trinity River as a major supply of surface water and will be making even greater demands on this source in the foreseeable future. Wallisville has been delayed for many years and it will play a strategic role in our ongoing efforts against land subsidence, property damage and flooding.

The use of the surface water as an alternate to ground water supplies is a major tactic in our effort against subsidence in the Houston area. In 1983 this committee assisted with the authorization of the modified Wallisville Lake project but as you have already heard today, the congressional action has been ruled invalid by a Federal judge who wrote, and I quote in sum, "the Congress simply exceeded its authority and infringed the Corps' sphere while the NEPA process was underway."

The judge declined to lift his 13-year-old injunction solely on procedural grounds without regard to the merits of the project. There was not any context to the evidence before the court that we have a real need for the project and that of all the alternatives, this is the cheapest, the fastest and the most environmentally sensitive plan to accomplish the dual Federal goals of water supply and the prevention of salt water intrusion.

So we solicit your continuing support for the project. We think it is very clear that the opponents are trying to kill by procedural delays what they cannot attack on the merits.

In fact, the Houston Post has reported that an attorney for the plaintiffs was elated and, quote, "predicting Bue's requirement for further review could kill the project".

Now, despite this, the local sponsors have indicated to the Chamber that they are very much interested in and prepared to continue their efforts to see the lake completed. In addition to Lake Wallisville, the chamber also is interested in and recognizes that we have a need for a joint Bureau of Reclamation and TRA study of Bedias Lake in the Mid-Trinity River Basin area.

The preliminary estimates put the water supply yield of this lake as high as a hundred million gallons a day and this water could be easily transferred to any or all of three separate watersheds.

This means that we could receive the water in all areas of Houston which is a major strategic consideration for us. Although Houston has no firm commitment to Bedias Lake at this time the potential is such that we strongly support the feasibility study. Thank you for the opportunity to appear.

[The statement of Ms. Dinkins follows:]

STATEMENT OF
CAROL DINKINS
REPRESENTING
THE HOUSTON CHAMBER OF COMMERCE
TO THE
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT
COMMITTEE ON APPROPRIATIONS
APRIL 9, 1986

MR. CHAIRMAN AND COMMITTEE MEMBERS, MY NAME IS CAROL DINKINS, OF VINSON & ELKINS, HOUSTON, TEXAS. I AM TESTIFYING TODAY AS THE REPRESENTATIVE OF THE HOUSTON CHAMBER OF COMMERCE.

HOUSTON CURRENTLY LOOKS TOWARD THE TRINITY RIVER AS A MAJOR SOURCE OF SURFACE WATER AND WILL BE MAKING EVEN GREATER DEMANDS ON THIS SOURCE IN THE FORSEEABLE FUTURE.

THE LONG DELAYED WALLISVILLE PROJECT AT THE MOUTH OF THE TRINITY RIVER WILL PLAY A STRATEGIC ROLE IN OUR ON-GOING EFFORTS AGAINST LAND SUBSIDENCE AND THE RESULTING FLOODING AND PROPERTY DAMAGE. THE USE OF SURFACE WATER AS AN ALTERNATIVE TO THE PUMPING OF WELL WATER IS A MAJOR TACTIC IN THE STRUGGLE AGAINST SUBSIDENCE.

IN 1983, THIS COMMITTEE ASSISTED WITH THE AUTHORIZATION OF THE MODIFIED WALLISVILLE LAKE PROJECT AND

WE APPRECIATE THAT ASSISTANCE. AS YOU HAVE HEARD TODAY, HOWEVER, THAT CONGRESSIONAL ACTION HAS BEEN RULED INVALID BY A FEDERAL DISTRICT JUDGE WHO WROTE AS FOLLOWS: "IN SUM, THE CONGRESS SIMPLY EXCEEDED ITS AUTHORITY AND INFRINGED THE CORPS' SPHERE WHILE THE NEPA PROCESS WAS UNDERWAY." THUS, THE JUDGE HAS DECLINED TO LIFT THE 13 YEAR OLD INJUNCTION SOLELY ON PROCEDURAL GROUNDS, REGARDLESS OF THE MERITS OF THIS PROJECT. THE EVIDENCE BEFORE THE COURT WAS UNCONTESTED THAT THERE IS A REAL NEED FOR THE PROJECT, AND THAT OF ALL THE ALTERNATIVES EVALUATED THIS LAKE IS THE CHEAPEST, QUICKEST, AND MOST ENVIRONMENTALLY SENSITIVE PLAN TO ACCOMPLISH THE DUAL FEDERAL AIMS OF PROVIDING A WATER SUPPLY AND PREVENTING SALT WATER INTRUSION.

WE SOLICIT THE CONTINUING SUPPORT OF THIS COMMITTEE FOR THE PROJECT. THE OPPONENTS OF THIS PROJECT ARE CLEARLY SEEKING TO KILL BY PROCEDURAL DELAYS WHAT THEY CANNOT ATTACK ON THE MERITS. INDEED, ON MARCH 26, 1986, THE HOUSTON POST REPORTED THAT AN ATTORNEY FOR THE PLAINTIFFS WAS "ELATED" AND "PREDICTED BUE'S REQUIREMENT FOR FURTHER REVIEW COULD KILL THE PROJECT." DESPITE THESE FACTS, THE LOCAL SPONSORS HAVE INFORMED THE CHAMBER THAT THEY ARE PREPARED TO CONTINUE THEIR EFFORTS TO SEE LAKE WALLISVILLE COMPLETED.

THE HOUSTON CHAMBER OF COMMERCE RECOGNIZES THE IMMINENT NEED FOR A JOINT BUREAU OF RECLAMATION/TRINITY RIVER AUTHORITY STUDY OF A BEDIAS LAKE IN THE MID-TRINITY RIVER BASIN AREA TO AUGMENT FURTHER DEVELOPMENT OF OUR WATER RESOURCES.

PRELIMINARY ESTIMATES PUT THE WATER SUPPLY YIELD OF THIS LAKE AS HIGH AS 100 MILLION GALLONS PER DAY. WATER GENERATED BY A BEDIAS LAKE COULD READILY BE TRANSFERRED INTO ANY OR ALL OF THREE SEPARATE WATERSHEDS. THIS WOULD MAKE POSSIBLE THE DELIVERY OF RAW WATER TO EITHER THE EAST, NORTH OR WEST SIDE OF THE MASSIVE HOUSTON METROPOLITAN AREA, A MAJOR STRATEGIC CONSIDERATION IN ITSELF. WHILE HOUSTON HAS NO FIRM CURRENT COMMITMENT TO A BEDIAS LAKE AT THIS TIME, THE POTENTIAL IS SUCH THAT WE STRONGLY SUPPORT THIS FEASIBILITY STUDY.

Mr. RIEHN. Mr. Chairman, members of the committee, I am very pleased to appear with you today. My name is Carl Riehn. I am General Manager and Executive Director of the North Texas Municipal Water District. Today I represent the local sponsors on the Cooper Lake, Texas Project, which includes the City of Irving, Sulphur River Municipal Water District and the North Texas Municipal Water District. These entities serve approximately 850,000 people in the State of Texas with potable drinking water.

As you are aware, the Cooper Lake, Texas Project was originally authorized in 1955 and based on local contracts for 100 percent repayment for water supply cost the project was placed under construction in 1968. In 1971 after the passage of the National Environmental Policy Act in 1969, a Federal injunction stopped the project for lack of an environmental impact statement. The project stayed captive to the Federal courts from March 1971 to July 1984.

The people in the area never objected to the project and always supported the need for flood control, water supply, and water recreation on the South Sulphur River. Only an environmental group opposed to the development of all water resource projects in Texas went to the courts to stop the construction.

The project is still vitally needed for all of the Federal and local purposes included. The only difference is that the cost will be substantially higher. But each year the area grows and water supply and flood protected land become more valuable, therefore, it is urged that this committee and the Congress work with the U.S. Army Corps of Engineers to expedite this project that has been delayed for over 15 years.

It is our understanding that in the President's budget 3.7 million dollars is allocated to continue the Cooper Lake Project; however, that the Fort Worth District Corps of Engineers has developed a criteria that will allow them to expedite the project if an additional 3.1 million dollars can be made available. This information was not available during preparation for the President's budget.

It is our understanding this could speed the project by 12 to 18 months. We realize the financial strain on the Federal Government to reduce the deficit; however, the building, or investment in the natural resources of this nation has been one of our greatest strengths bringing many returns to the citizen. The additional cost burdens brought about by the long delay, as well as the burden of having to develop emergency facilities to meet short term needs should be considered by this body.

We hope that you will strongly recommend that the additional 3.1 million dollars be added to the President's appropriation for the Cooper Lake, Texas Project for a total of $6.8 million.

Thank you.

[The statement of Mr. Riehn follows:]

STATEMENT OF

CARL W. RIEHN
COOPER LAKE - TEXAS PROJECT
To The
SUB-COMMITTEE ON ENERGY AND WATER
COMMITTEE ON APPROPRIATIONS
HOUSE OF REPRESENTATIVES
APRIL 1986

Mr. Chairman and Committee Members:

My name is Carl W. Riehn. I am the General Manager and Executive Director of the North Texas Municipal Water District. Today I represent the local sponsors on the Cooper Lake - Texas Project, which includes the City of Irving, Sulphur River Municipal Water District and the North Texas Municipal Water District. These entities serve approximately 850,000 people in the State of Texas with potable drinking water.

As you are aware, the Cooper Lake - Texas Project was originally authorized in 1955 and based on local contracts for 100% repayment for water supply cost the project was placed under construction in 1968. In 1971 after the passage of the National Environmental Policy Act in 1969, a Federal Injunction stopped the project for lack of an Environmental Impact Statement. The project stayed captive to the Federal Courts from March 1971 to July 1984. The people in the area never objected to the project and always supported the need for flood control, water supply, and water recreation on the South Sulphur River. Only an environmental group opposed to the development of all water resource projects in Texas went to the courts to stop the construction of the project. The project is still vitally needed for all of the Federal and local purposes included. The

only difference is that the cost will be substantially higher. But, each year the area grows and water supply and flood protected land become more valuable, therefore, it is urged that this Committee and the Congress work with the U. S. Army Corps of Engineers to expedite this project that has been delayed for over fifteen years.

It is our understanding that in the President's Budget 3.7 million dollars is allocated to continue the Cooper Lake Project; however, that the Fort Worth District Corps of Engineers has developed a criteria that will allow them to expedite the project if an additional 3.1 million dollars can be made available. This information was not available during preparation of the President's Budget. We realize the financial strain on the Federal Government to reduce the deficit; however, the building, or investment in the natural resources of this nation has been one of our greatest strengths bringing many returns to the citizen. The additional cost burdens brought about by the long delay, as well as, the burden of having to develop emergency facilities to meet short term needs should be considered. We hope that you will strongly recommend that the additional 3.1 million dollars be added to the President's appropriation for the Cooper Lake - Texas Project for a total of 6.8 million dollars . Thank you.

TRINITY IMPROVEMENT ASSOCIATION
1986 CONGRESSIONAL HEARINGS
DELEGATE NAMES AND ADDRESSES

UPPER TRINITY

Trinity Improvement Association:

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Chairman of the Board
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Mr. Andrew Gibbs
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Mabank, TX 75147

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Mr. Bruce Smith
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Mr. John Gay
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Mr. Alan Thomas
Manager, Financial Affairs
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City of Cedar Hill:

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City of Cedar Hill
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The Honorable T. W. Cannady
Councilman
City of Cedar Hill
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The Honorable Cecil Wise
Councilman
City of Cedar Hill
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Mr. Greg Vick
City Manager
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City of Dallas:

The Honorable Annette Strauss
Mayor Pro-Tem
City of Dallas
City Hall, Room 5F North
Dallas, TX 75201

Mr. Mike Tubbs
Director of Water Utilities
City of Dallas
City Hall, Room 4A North
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The Honorable Joe Alford
Councilman
City of Denton
City Hall, 215 East McKinney
Denton, TX 76201

Mr. Lloyd Harrell
City Manager
City of Denton
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City of Duncanville:

The Honorable Cliff Boyd
Mayor
City of Duncanville
P. O. Box 280
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Mr. Dan Dodson
City Manager
City of Duncanville
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City of Grand Prairie:

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Mr. Bill Hargett
Director of Public Works
City of Grand Prairie
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City of Mansfield
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City of Midlothian
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Midlothian, TX 76065

Mr. Buddy Keisel
Acting City Manager
City of Midlothian
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Joe Pool Lake Planning Council:

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President
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Mr. Doug Kinsinger
Secretary Treasurer
Joe Pool Lake Planning Council
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Cedar Hill Chamber of Commerce:

Mr. & Mrs. W. S. Perminter
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Cedar Hill Chamber of Commerce
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Dallas Chamber of Commerce:

Mr. Tom Taylor
Member, Water Committee
Dallas Chamber of Commerce
333 West Campbell, Suite 400
Richardson, TX 75080

Duncanville Chamber of Commerce:

Mr. Steve Martin
President
Duncanville Chamber of Commerce
926 South Cedar Ridge
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Mr. John Thompson
Chairman, Economic Development
Duncanville Chamber of Commerce
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Grand Prairie Chamber of Commerce:

Mr. Jim Switzer
President
Grand Prairie Chamber of Commerce
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Mansfield Chamber of Commerce:

Mr. Arthur Blackwood
Director
Mansfield Chamber of Commerce
1102 Palm
Mansfield, TX 76063

Mrs. Elaine Russell
President, Women's Division
Mansfield Chamber of Commerce
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Midlothian Chamber of Commerce:

Mr. George Poff
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OTHER UPPER TRINITY INDIVIDUALS:

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MIDDLE TRINITY:

COUNTY OF MADISON:
The Honorable Billy Wilson
Commissioner
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Madison County Court House
Madisonville, TX 77864

COUNTY OF POLK:

The Honorable Wayne Baker
Judge
County of Polk
Polk County Court House
Livingston, TX 77351

The Honorable J. J. (Buddy) Purvis
Commissioner
County of Polk
Polk County Court House
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Mr. John Hebert
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Mr. Ernie Zieschang
Commissioner, Port Commission
Port of Liberty
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Chambers-Liberty Counties Navigation District:

Mr. Paul Crutchfield
General Manager
Chambers-Liberty Counties
Navigation District
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Anahuac, TX 77514

City of Liberty:

The Honorable C. Scott Parker
Mayor
City of Liberty
P. O. Box 407
Liberty, TX 77575

Houston Chamber of Commerce:

Mrs. Carol Dinkins
Member
Houston Chamber of Commerce
2815 First City Tower
Houston, TX 77002

Mr. PERRY. Thank you. On behalf of the whole delegation, you don't know how much we appreciate your willingness to sit and listen to us tell you our tale of woe. We also, as we told you last year, know you have budget deficiencies, but we stand ready to try to bear our burden on those deficiencies.

I think the only thing we are really asking is we turn our investments to the Nation's economy and the soundness of the Federal participation of the Trinity River Basin water resources development be taken into consideration when you arrive at your decisions.

Of course, as always, it has been a great pleasure to be here. You might tell Congressman Myers we missed him this morning. He usually has some comment about our cowboys.

Mr. BEVILL. He will be sorry he missed you. He will be down here later this morning. We are glad Mrs. Smith and Mr. Rudd got here before you left. It is always a fine group and I think your statement there about the resources, Carl, is still true. We can't stop investing in our resources just because we have got a deficit problem.

We have got to keep that. You know, we have a hard time up here making the distinction between expenses and investments. Of course, you businessmen know the difference.

I think these investments in our water resource projects are very important for our nation. We certainly will work with you and do the best we can to accommodate you.

Mr. PERRY. That is all we can ask for, Mr. Chairman. Thanks again.

[The statement of Mr. Wilson follows:]

April 9, 1986

STATEMENT

By U.S. Representative Charles Wilson of Texas before the Subcommittee on Energy and Water Development of the House Committee on Appropriations.

Thank you, Mr. Chairman, for the opportunity to testify regarding funding Water Resource Projects in the State of Texas, particularly those in or affecting the Second Congressional District, which I represent.

The Projects which I will cover are located in the Trinity River Basin, the Neches River Basin and San Jacinto River Basin.

TRINITY RIVER BASIN

The Trinity River Project consists of a Multiple-Purpose Channel for flood control, recreation and navigation from Trinity Bay to Liberty. The President's Proposed Budget contains $200,000.00 for Phase II studies and I ask that these funds be included.

Although not in the Second Congressional District, the Joe Pool Lake Project, when completed will assist in easing the flooding in portions of the mid-Trinity Basin. This is a

flood control, water supply and recreation project located in southeast Tarrant and southwest Dallas counties. The President's proposal contains $9.7 million for construction and $351,000.00 for operation and maintenance. Your support for these proposed amounts would be appreciated.

As you may already know, we still have problems with the Wallisville Lake Project. Less than ten days ago, Judge Carl Bue issued a decision on the Wallisville Project that stated, in part, that Congress acted improperly when it reauthorized the project in 1983. I urge you to review Judge Bue's opinion and consider additional action that would finally clear up this matter. Wallisville is still needed and must be completed.

There is another project related to the Trinity River Basin, but not under the jurisdiction of the Corps of Engineers, for which I ask your support in funding. It is the Department of Interior Bureau of Reclamation General Investigation of the Bedias Reservoir Project for water supply located in Madison, Walker and Grimes Counties. The President's proposal for Fiscal Year 1987 is $1.6 million to continue the investigations for the feasibility of this water supply project for the Lower Trinity Basin and Upper Gulf Coast areas. I urge your support for this amount.

NECHES RIVER BASIN

Rockland Lake is classified as an active project and the Fiscal Year 1986 Appropriation included $250,000 for completion of a reevaluation report before starting on the general and detailed design memorandum.

I have been supportive of the funding for the reevaluation study to determine or reaffirm water resource needs which might be provided by construction of this project. However, we have received sufficient response from those who would be affected by the project to conclude that there is very little support for development of the Rockland Lake Project at this time. In fact, we have found overwhelming opposition for its development.

We have conferred with the Fort Worth District Engineer and found that the remaining funds provided in Fiscal Year 1986 are sufficient to reach a determination of whether or not the Rockland Lake is a viable project. With this in mind and the lack of support in the area for the project, plus the serious need to reduce deficit spending wherever possible, I propose that the $450,000 contained in the President's proposed Fiscal Year 1987 Budget for Rockland Lake be deleted. We are not asking that the project be deauthorized, but consider that additional funding beyond those provided in Fiscal Year 1986 cannot be justified at this time.

SAN JACINTO RIVER BASIN

Montgomery County, part of which is in the Second Congressional District, is experiencing a steady increase in population. Much of this growth comes from the large number of people working in the Houston area and living in Montgomery County.

A study is now being conducted to determine the surface water resource potential to meet the growing demand for water supply, to prevent further subsidence, and to decrease flooding and eliminate the repeated losses to the residents in that area. The Proposed Budget for Fiscal Year 1987 includes $250,000 to continue the study on the San Jacinto River and Tributaries and I urge your support for this funding.

In addition, the Bureau of Reclamation is conducting a study of the San Jacinto River Basin related to the development of a multi-purpose flood control and water supply for Montgomery County, Conroe and The Woodlands. The Proposed Budget for Fiscal Year 1987 includes $120,000 to continue this study and I support this funding.

KIKA DE LA GARZA
15TH DISTRICT, TEXAS

Congress of the United States
House of Representatives
Washington, DC 20515

STATEMENT BY

E (Kika) de la Garza, M C
Before the
Subcommittee on Energy and Water Development
House Committee on Appropriations

9 April 1986

Mr Chairman, I am grateful for the opportunity to appear before your Subcommittee today in support of reclamation and civil works projects in my district, the 15th District of Texas.

While all the projects are contained in the Administration's budget, for your information I will briefly summarize them because every one is of enormous importance.

The reclamation projects are:

Nueces River Project (Choke Canyon Dam and Reservoir) $1,420,000 for continued construction and land acquisition

Delta Lake Irrigation District Loan Program $1,000,000 to continue rehabilitation work on existing irrigation facilities which serve 69,000 acres

Hidalgo County Irrigation District No 1, Supplemental Loan Program. $3,800,000 to continue rehabilitation work on existing irrigation facilities. The project will also include replacing 55 miles of open laterals with pipeline, and purchasing additional operation and maintenance equipment.

Hidalgo County Irrigation District No 2 $2,500,000 to continue rehabilitation work on the distribution system which supplies irrigation water to about 62,700 acres and supplies 9,430 acre-feet of water to cities and domestic users. The loan will also provide for construction of an office building and purchase of maintenance equipment.

These projects are well on their way to being completed, and all concerned are delighted with the progress.

The civil works projects are:

Corpus Christi Ship Channel Navigation Project
$7,000,000

Corpus Christi Ship Channel Operation and Maintenance
$2,730,000

The civil works projects are both in Corpus Christi. Let me make it very clear that I support these projects wholeheartedly because I represent the western segment of Corpus Christi, and as such I support and endorse them.

It is good, Mr Chairman, to appear before your Subcommittee annually--and it is particularly good to come in support of budgeted items.

These are important projects, Mr Chairman, and I pray you will see fit to include all of them in the Energy and Water Development Appropriations Bill.

Thank you for your time.

59-750 O—86——6

April 15, 1986

The Honorable Tom Bevill
Chairman, Subcommittee on Energy
and Water Development
Committee on Appropriations
U.S. House of Representatives
2362 Rayburn House Office Building
Washington, D.C. 20515

Dear Congressman Bevill:

Please consider the enclosed testimony with regard to certain public works projects administered by the Bureau of Reclamation in the State of Texas.

The Texas Water Development Board is primarily responsible for proper development and conservation of our water resources and, in that regard, carefully examines and analyzes each project. We respectfully request consideration by the Committee of the Board's statement concerning the appropriation of funds to be used by the Bureau of Reclamation in the State of Texas.

Thank you for your consideration.

Sincerely,

Charles E. Nemir
Executive Administrator

Enclosure

STATEMENT

OF THE

TEXAS WATER DEVELOPMENT BOARD

REGARDING

BUREAU OF RECLAMATION INVESTIGATIONS AND PROJECTS

IN THE

STATE OF TEXAS

PRESENTED TO THE

SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

COMMITTEE ON APPROPRIATIONS

U.S. HOUSE OF REPRESENTATIVES

APRIL 15, 1986

The Texas Water Development Board respectfully submits project testimony regarding Bureau of Reclamation projects in the State of Texas.

Responsibility for statewide planning and development of water resources rests with the Texas Water Development Board. The Board also provides financial assistance to eligible political subdivisions of the State for the planning and construction of water, wastewater treatment, and flood-control projects. The Board has been designated as the State agency to cooperate with appropriate agencies of the Federal government and with other State and local agencies in matters relating to water resource development. In order to assure orderly development of the State's water resources, the Board has formulated and adopted a comprehensive Statewide "Texas Water Plan", which under Texas statutes serves as a flexible guide for present and future water development in Texas.

The plan indicates the need for specific projects, including alternatives, to meet the State's water needs and to provide for National, State, and regional economic growth and stability. The Water Development Board maintains a continuing planning program in order to address changing economic, social, hydrologic, and environmental conditions in the State. The projects addressed in this statement are considered as integral elements in the State's present and future water resource development program.

BEDIAS LAKE PROJECT

The Board's planning work indicates that the Houston-Galveston metropolitan area will continue to grow rapidly and will therefore need additional firm surface-water supplies in the immediate future in order to avoid further reliance on ground-water resources. The area continues to experience serious land subsidence problems due to heavy ground-water pumpage. Bedias Lake has been identified as a potential water supply project for the area and has been included in the State's plan for development since the middle 1960's. The Lake has been included as an element of a "continuing" plan to supply water for municipal and industrial purposes in the lower Trinity River Basin. The future water requirements of the metroplex in excess of needs which can be met by local supplies can be partially met from Bedias Lake.

The President has included in his FY 1987 budget proposal $1,600,000 to complete a four-year study program by the Bureau of Reclamation to investigate the hydrologic and economic feasibility of Bedias Lake and to initiate work on a draft planning report and environmental impact statement. The future water supply needs of the Lower Trinity River Basin are increasing and we strongly urge your consideration of the amount included in the President's budget for FY 1987 for the Bedias Lake study.

SAN JACINTO RIVER PROJECT

The President's budget recommends $120,000 be provided in FY 87 to complete feasibility studies of two potential reservoir sites in the San Jacinto River Basin.

The San Jacinto River Basin and neighboring areas continue to grow rapidly. Much of the area has depended upon ground water to satisfy its municipal and industrial water needs in the past. The result has been a significant lowering of water levels within the area and severe land subsidence. Subsidence problems are extremely serious in that subsidence has aggravated local area drainage and flooding problems and also subjects the people and property of this region to tidal surges during hurricanes.

The Board's projections indicate that additional surface water supplies will be needed in the mid-1990's in order to meet the growing demands for municipal and industrial water. Thus, the Board supports the President's recommendation for funding in FY 87 to complete the feasibility studies on the San Jacinto River Project.

NUECES RIVER PROJECT

A total of $1,420,000 is included in the President's FY 87 budget for construction of recreation facilities and fishery management activities for the Nueces River Project. The Board supports the President's recommendation for funding in FY 87.

PALMETTO BEND PROJECT

A total of $150,000 is included in the President's FY 87 budget for completion of construction of the Palmetto Bend Project. The Board supports the President's recommendation for funding in FY 87.

SMALL PROJECT LOAN PROGRAM

The Board supports the President's recommended funding during FY 87 to the following small projects: Delta Lake Irrigation District ($1,000,000); Hidalgo County Irrigation District No. 1 ($3,800,000); and Hidalgo County Irrigation District No. 2 ($2,500,000).

CONCLUDING COMMENTS

The Texas Water Development Board sincerely appreciates this opportunity to provide testimony to the Committee and most respectfully urges the appropriation of funds as requested in order to accomplish properly coordinated, timely, and orderly development of these urgently needed water resource projects in the State of Texas.

TEXAS WATER DEVELOPMENT BOARD

By: Charles E. Nemir

Charles E. Nemir
Executive Administrator

DUNCANVILLE CHAMBER OF COMMERCE

300 EAST WHEATLAND ROAD • POST OFFICE BOX 380036
DUNCANVILLE, TEXAS 75138
214-298-6128

RESOLUTION

WHEREAS, Joe Pool (Lake) Reservoir is an essential water resources development project which will provide flood control, water supply and recreational benefits to a population of more than 1.6 million people; and

WHEREAS, construction, relocation and clearing are nearing completion with previously appropriated funds and water impoundment has begun; and

WHEREAS, the U.S. Army corps of Engineers has indicated a Division capability of 9.7 million dollars for the continuation of construction of Joe Pool (Lake) Reservoir in Fiscal Year 1987 and

WHEREAS, appropriation of funds equal to the Corps capability will enable a timely completion of Joe Pool (Lake) Reservoir, thereby avoiding inflation-caused escalation of the cost of the Reservoir and allowing citizens to receive the vital benefits to be provided by the Reservoir at the earliest possible time:

NOW, THEREFORE, BE IT RESOLVED BY THE DUNCANVILLE CHAMBER OF COMMERCE OF DUNCANVILLE, TEXAS:

That the Congress of the United States is urged to appropriate 9.7 million dollars to finish land acquisition and culture resource preservation and complete ongoing contracts and initiate and continue contracts for additional recreational facilities for Joe Pool (Lake) Reservoir which represents the necessary 1987 Fiscal Year appropriations for the Corps of Engineers for that project, thereby reducing the construction time and ultimately causing the saving of taxpayer's money in the cost of the Reservoir. The DUNCANVILLE CHAMBER OF COMMERCE would like to take this opportunity to express the sincere appreciation of our 700 members and the citizens of Duncanville toward the Congress of the United States for providing the continuity of support and making this project a reality.

Passed and approved this 19th day of March, 1986.

Steve Martin
President

Doug Kinsinger
Executive Director

RESOLUTION # 1986-05

WHEREAS: Joe Pool (Lake) Reservoir is an essential water resources development project which will provide flood control, water supply and recreational benefits to a population of more than 1.6 million people; and

WHEREAS: The impoundment gates have now been closed, and construction is nearing completion; and

WHEREAS: The U. S. Army Corps of Engineers has indicated a Division capability of 9.7 million dollars for the finishing of construction of Joe Pool (Lake) Reservoir in Fiscal Year 1987; and

WHEREAS: Appropriation of funds equal to the Corps capability will enable a timely completion of Joe Pool (Lake) Reservoir, allowing citizens to receive the vital benefits to be provided by the Reservoir at the earliest possible time;

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF DUNCANVILLE, TEXAS:

That the Congress of the United States is urged to appropriate 9.7 million dollars for finishing of construction of Joe Pool (Lake) Reservoir, which represents the necessary 1987 Fiscal Year appropriations for the Corps of Engineers for that project. The City Council of Duncanville would like to take this opportunity to express the sincere appreciation of the citizens of Duncanville toward the Congress of the United States for providing the continuity of support and making this project become a reality.

DULY RESOLVED by the City Council of the City of Duncanville, Texas, on the 14th day of April, A.D. 1986.

Cliff Boyd, Mayor

ATTEST:

Laurie Lane, City Secretary

WEDNESDAY, APRIL 9, 1986.

NORTHWEST OKLAHOMA STUDY

WITNESS

HON. GLENN ENGLISH, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF OKLAHOMA

Mr. BEVILL. Next we have Mr. Walter Helm. Is Mr. Helm in?

[Recess.]

Mr. BEVILL. We are glad to have our good friend here, Congressman Glenn English. We will just turn it over to you, Glenn, and you proceed as you may wish.

Mr. ENGLISH. Thank you very much, Mr. Chairman.

Mr. Chairman, I appreciate this opportunity to appear before you and the subcommittee members today on behalf of the Northwest Oklahoma Water Supply Study, a study which is important to thousands of my constituents in Northwest Oklahoma. In its budget request for fiscal year 1987 the Bureau of Reclamation included $170,000 for the continuation of the Northwest Oklahoma Water Supply Study. The NOWS study is an ongoing four-year project which the Bureau initiated in 1984. The study will determine the short and long term municipal and industrial water supply needs of eight northwest Oklahoma counties covering approximately 11,545 square miles. The Bureau officials note that the study involves one of the most water deficient areas in Oklahoma and that the declining ground water supply poses a critical problem which could threaten the economic well-being of the entire region.

The average annual rainfall in the area totals only 18 inches and provides virtually no relief to the diminishing ground water supply. The State of Oklahoma is suffering from severe economic conditions stemming from the depressed oil and agricultural industries.

Economic recovery in northwest Oklahoma will in part depend upon the basic water resources available to developing industries. As each member of this subcommittee is extremely aware, sufficient water resources must not be taken for granted. I feel that the Northwest Oklahoma Water Supply Study will play an extremely vital role in ensuring that this area of Oklahoma has adequate and proper planning for water usage and development and will help ensure a dependable water supply for years to come. The study enjoys the continued support of the Oklahoma Water Resources Board as well as the Oklahoma State Governor.

Mr. Chairman, on behalf of over 75,000 Northwest Oklahoma residents who must depend upon this water supply, I urge you to include the Bureau of Reclamation's $170,000 funding request for the Northwest Oklahoma Water Supply Study project in your fiscal year 1987 appropriations legislation. Thank you.

Mr. BEVILL. Thank you very much.

WEDNESDAY, APRIL 9, 1986.

TEXAS PROJECTS

WITNESSES

HON. JIM CHAPMAN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF TEXAS
DON ABERNATHY, SULPHUR RIVER BASIN
WALTER HELM, SULPHUR RIVER BASIN
LOWELL CABLE, SULPHUR RIVER BASIN
DANNY DUNCAN, SULPHUR RIVER BASIN
JOE FRED LOX, SULPHUR RIVER BASIN

Mr. BEVILL. Next we have our good friend, Jim Chapman.

Mr. WATKINS. I appreciate you coming to testify on this. I know your interest in it and others out there. We have got a bunch of budget problems but I guarantee we will try to do what we can.

Mr. ENGLISH. I will appreciate all the help we can get.

Mr. BEVILL. Jim, we'll be glad to hear from you.

Mr. CHAPMAN. Thank you, Mr. Chairman.

Mr. Chairman, and members of the distinguished committee, let me first introduce the members of the Sulphur River Basin here with me. Mr. Don Abernathy, Walter Helm, Joe Fred Lox and Danny Duncan, all here from East Texas.

Mr. BEVILL. Glad to have each of you here with us.

Mr. CHAPMAN. Mr. Chairman, I am here on behalf of the Cooper Lake Project which must be one of the oldest public works projects in America. I was eight-years-old and my dad was a member of the State legislature in Texas when he first came here to see Chairman Patman to see this project authorized.

I remember him coming back to Sulphur Springs at that time and as the young man told me it looked like there might be a nice lake in northeast Texas I would get to waterski on before I got out of high school. That was 33 years ago and my high school diploma has already turned yellow and I haven't skied on it yet.

I have a ten-year-old son and I would like for him to be able to ski on that lake before he gets out of high school.

Mr. BEVILL. Mr. Patman was my chairman when I first came to Congress. He used to talk about serving down there in the State Texas legislature with Sam Johnson, Lyndon Johnson's father.

Mr. CHAPMAN. We have finally overcome the legal obstacles to the moving forward on this project. The project construction-wise is now 17 percent complete. The President's budget has $3.7 million in it for this project for fiscal year 1987.

The Corps of Engineers has expressed an additional capability of $3.1 million. We would request this subcommittee to consider the full capability expressed by the Corps of Engineers.

We are excited about the project and looking forward to it. I have prepared a statement which I have submitted for the record, as I am aware of the time constraints of this committee.

I appreciate your consideration. I know that this is an old project that you have been working on for many years. We in East Texas appreciate your continued concern and hope you will favorably review our appropriations request for fiscal year 1987.

Mr. BEVILL. I certainly hope we can accommodate you on this. Thank each of you for coming.

Mr. CHAPMAN. Thank you, Mr. Chairman.

[The statement of Mr. Chapman follows:]

STATEMENT OF CONGRESSMAN JIM CHAPMAN, BEFORE

SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT
HOUSE COMMITTEE ON APPROPRIATIONS
WEDNESDAY, APRIL 9, 1986

MR. CHAIRMAN, AND MEMBERS OF THIS DISTINGUISHED SUBCOMMITTEE:
I APPRECIATE THIS OPPORTUNITY TO APPEAR BEFORE THE SUBCOMMITTEE WITH OUR TEXAS WATER RESOURCE GROUPS. I DO SO TO EARNESTLY SOLICIT YOUR CONTIUNED ASSISTANCE AND SUPPORT FOR THE COOPER LAKE PROJECT, A MULTIPLE-PURPOSE RESERVIOR TO SERVE THE FLOOD CONTROL AND WATER DEVELOPMENT NEEDS OF A SIGNIFICANT PORTION OF NORTHEAST TEXAS. I WOULD LIKE TO WELCOME THE MANY REPRESENTATIVES OF OUR TEXAS WATER RESOURCE GROUPS, AND I WOULD ALSO LIKE TO WELCOME TO WASHINGTON MY FRIEND AND CONSTITUENT, MR. WALTER HELM, AND HIS SULPHUR RIVER MUNICIPLE WATER DISTRICT BOARD, LOWELL CABLE, DANNY DUNCAN, JOE FRED LOX, AND DON ABERNATHY. MR. HELM HAS BEEN IN THE FOREFRONT OF OUR STRUGGLE IN NORTHEAST TEXAS TO COMPLETE THE COOPER LAKE PROJECT AND HE IS HERE TODAY REPRESENTING THE SULPHUR RIVER MUNICIPLE WATER DISTRICT.

THIS IS A CRITICAL TIME FOR THOSE OF US WHO HAVE LABORED SO LONG AND HARD FOR THE MANY NECESSARY PROJECTS IN EAST TEXAS. EXPERT WITNESSES ARE APPEARING BEFORE YOU TODAY, SO I WON'T INDULGE THE TIME OF THE SUBCOMMITTEE. BUT, I WANT TO PUT IN A STRONG BID FOR THE CONTINUATION OF THE COOPER LAKE PROJECT AT THE AMOUNT EXPRESSED BY THE CORPS OF ENGINEERS AS THEIR CAPABILITY FOR FY 87, $6.8 MILLION.

MR. CHAIRMAN, WHILE I AM STILL NEW TO THE HILL, THE PROBLEMS OF AN ADEQUATE WATER SUPPLY ARE ANYTHING BUT NEW TO THE PEOPLE OF EAST TEXAS. FOR OVER 30 YEARS, RESIDENTS OF EAST TEXAS HAVE SUFFERED BOTH SEVERE DROUGHT CONDITIONS AND UNCONTROLLED FLOODING. THERE HAS BEEN A LACK OF QUALITY DRINKING WATER, AND AN INCREDIBLE GROWTH IN POPULATION TO THE NORTH AND EAST OF THE CITY OF DALLAS. IN THE CITY OF COOPER, TEXAS, CITIZENS OFTEN MUST LITERALLY HAND CARRY DRINKING WATER TO THEIR HOMES. AT ONE TIME THE SITUATION BECAME SO INTOLERABLE THAT THE STATE OF TEXAS TRUCKED IN WATER FOR THE CITIZENS OF COOPER IN ORDER THAT THEY WOULD HAVE WATER TO DRINK. FURTHER, TENS OF THOUSANDS OF PRODUCTIVE LAND ACRES HAVE BEEN LOST DUE TO EROSION AND FLOODING.

IN RESPONSE TO THESE VITAL WATER RESOURCE NEEDS OF SOME SIX COUNTIES IN EAST TEXAS, THE COOPER LAKE PROJECT WAS ORIGINALLY AUTHORIZED BY THE FLOOD CONTROL ACT OF 1955 --- THANKS TO THE SUPPORT AND HARD WORK BY THE LATE CHAIRMAN WRIGHT PATMAN, AND THE LATE SPEAKER OF THE HOUSE, SAM RAYBURN. I HOPE THIS COMMITTEE WILL JOIN IN SUPPORTING HUNDREDS OF THOUSANDS OF EAST TEXANS IN MOVING FORWARD TOWARD CONSTRUCTION OF THE COOPER LAKE PROJECT.

MR. CHAIRMAN, YOUR COMMITTEE IS VERY FAMILIAR WITH COOPER LAKE, AND I AM FULLY AWARE THAT THIS SUBCOMMITTEE HAS ALWAYS BEEN GENEROUS AND HELPFUL TO THE RESIDENTS OF NORTHEAST TEXAS IN APPROPRIATING FUNDS FOR COOPER RESERVOIR. UNFORTUNATELY, SINCE ITS ORIGINAL AUTHORIZATION, THIS PROJECT HAS SUFFERED A MYRAID OF SETBACKS, PRIMARILY DUE TO FEDERAL COURT CHALLANGES TO A MANDATED ENVIRONMENTAL IMPACT STATEMENT. AS A RESIDENT OF EAST TEXAS,

THE DELAY ON THE PROJECT HAS BEEN ONE OF THE MOST FRUSTRATING EVENTS OF MY LIFE. WHEN I WAS EIGHT YEARS OLD, MY DAD, THEN A TEXAS LEGISLATOR, UPON RETURNING FROM A TRIP TO WASHINGTON, D.C. TO APPEAR BEFORE THIS COMMITTEE, SAID I WOULD BE SKIING ON THE LAKE BEFORE I GRADUATED FROM HIGH SCHOOL. NOW, THIRTY-THREE YEARS LATER, MY HUGH SCHOOL DIPLOMA HAS ALREADY TURNED YELLOW AND I'M ABOUT TO GET TOO OLD TO SKI -- THE PROJECT HAS COME UP AGAINST SO MANY SNAGS. FRANKLY, THIS PROJECT HAS DRAGGED ON MUCH TOO LONG. IT SEEMS THAT EVERY VESTED INTEREST HAS RECEIVED CONSIDERATION ON COOPER, WITH THE EXCEPTION OF THE PEOPLE OF MY DISTRICT WHO ARE TOTALLY FRUSTRATED AND SHOCKED OVER THE 31 YEAR DELAY IN THIS PROJECT. I AM HOPEFUL, HOWEVER, THAT WITH THE PASSAGE OF THE FISCAL YEAR 1987 ENERGY AND WATER DEVELOPMENT APPROPRIATIONS BILL, THE MOMENTUM FOR COMPLETION OF THIS MUCH NEEDED PROJECT WILL BE ESTABLISHED.

I BELIEVE THAT THE AUTHORIZED $3.7 MILLION IN FEDERAL FUNDS WITH THE ADDITION OF THE $3.1 MILLION IN ADDED CAPABILITY IS AN IMPORTANT FIRST STEP, AND I RESPECTFULLY REQUEST THIS SUBCOMMITTEE TO APPROVE THIS AMOUNT OF FUNDS FOR THE COOPER LAKE PROJECT. NORTHEAST TEXAS DESPERATELY NEEDS THIS WATER AND FLOOD CONTROL PROJECT. AND COOPER LAKE IS ABSOLUTELY VITAL TO THE FUTURE NEEDS IN MY AREA OF TEXAS.

MR. CHAIRMAN, I FEEL THAT I HAVE ALREADY TAKEN TOO MUCH TIME, HOWEVER, IN CLOSING I ALSO WANT TO ENCOURAGE FAVORABLE CONSIDERATION OF SOME OTHER PROJECTS IN AND AROUND MY CONGRESSIONAL DISTRICT: THE TRINITY RIVER BASIN PROJECTS AND LAKE RAY ROBERTS PROJECT.

WEDNESDAY, APRIL 9, 1986.

MYRTLE BEACH STUDY, SOUTH CAROLINA

WITNESS

HON. ROBIN TALLON, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF SOUTH CAROLINA

Mr. BEVILL. My good friend and colleague, Robin Tallon, is here. I will be glad to hear from you.

Mr. TALLON. Mr. Chairman, thank you very much. I appreciate the opportunity to appear before you and members of the subcommittee. I am here today in support of an ongoing project by the Army Corps of Engineers in my congressional district in South Carolina. The project is a beach erosion and hurricane protection study for the coastline of Horry County and a portion of Georgetown County.

The study area is part of what is known as the "Grand Strand" of South Carolina, and extends 36.7 miles from Little River Inlet in Horry County to Murrells Inlet in Georgetown County.

The economic importance associated with the completion of this study is great. The population of Horry County is increasing at more than double the rate of the overall State. And the Grand Strand permanent population is increasing at a rate nearly 50 percent greater than that of Horry County.

As well, the County is ranked in the top 20 counties nationwide in percentage of population growth from 1980 to 1985. As you can imagine, tourism is the largest industry, with 11 million people visiting the area each year, bringing in revenues over $1.5 billion.

This study was authorized in 1981 and has received Energy and Water appropriations in fiscal year 1982–1985. While funding is not included in the Army Corps of Engineers fiscal year 1987 request, the $200,000 needed to complete the study was identified after the budget was prepared and is included in the Corps' capability list.

The remaining study needs mainly concern economic analysis, design and costing, and evaluation of sand sources for the control of beach erosion and hurricane protection. The Corps believes shore protection by means of either offshore breakwaters or beach nourishment is very promising.

These additional funds for a project that was scheduled to be completed are required due to the complexity resulting from intense development in the area and problems in locating sand sources.

Mr. Chairman, in these times of budgetary austerity, we must carefully consider the allocation of each Federal dollar. To maximize those funds already spent on this project, I feel that $200,000 for its completion would be a responsible action.

I would certainly appreciate any consideration the committee might give us. I will be happy to answer any questions.

Mr. BEVILL. Thank you very much for a very fine presentation. We will do what we can.

WEDNESDAY, APRIL 9, 1986.

MINNESOTA PROJECTS

WITNESS

STATEMENT OF JAMES OBERSTAR, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF MINNESOTA

Mr. BEVILL. Jim Oberstar is here and we will be glad to hear from you.

Mr. OBERSTAR. Thank you, Mr. Chairman. I have a complete, detailed statement which I submitted in advance.

Mr. BEVILL. It will be made part of the record.

Mr. OBERSTAR. Thank you very much, Mr. Chairman. I am here as I have been almost every year since I have served in the Congress to ask for this committee's support which has been forthcoming and perhaps not in the dollar amounts, but certainly in the target areas that we have felt have been necessary for our State of Minnesota and for my particular district.

I greatly appreciate the time and effort and attention that you, Mr. Chairman, members of the committee, have given to the needs we have articulated over the years. This year there are two projects in the Corps of Engineers' budget request for a Duluth/Superior Harbor, $180,000 for survey funds to continue the planning, engineering and development of the Duluth/Superior Harbor. That affects both Minnesota and Wisconsin.

The two cities are joined in their effort to develop the harbor capabilities and shipping potential in that harbor.

The second item the Corps submitted in its budget request is $5.5 million in operation and maintenance for continuing work on the entrance piers into the inner harbor in Duluth. It has been terribly scoured and eroded and in danger of collapse and work has been underway to strengthen those entrance piers.

That work is well in progress and we greatly appreciate the committee's support last year for this necessary work at the choke point, the key entrance point to the commercial value of the Duluth Harbor.

One project that is not in the Corps' budget that I would ask the committee to consider is $675,000 item for the Silver Bay Harbor of refuge. It is a long authorized project. I will admit, as the community finally does admit, that they dragged their feet for many years.

I have tried to get the community to put up local funds, seeing some ten years ago the need for this project. But times change and people's attitudes tend to focus when there are some external pressures. Here that external pressure is 80 percent unemployment.

Mr. BEVILL. Eighty percent, do you say?

Mr. OBERSTAR. The iron ore mining industry in that part of my district, due to the decline in steel, has caused a layoff of 80 percent of the workers in the towns of Silver Bay and Babbitt which are the combined base of the Reserve Mining Company. We have lost a payroll of $450 million down to barely a $100 million in this area.

The impact has been devastating. Schools have closed. Libraries have had to close. Economic activity has slowed to a point where we are down to one doctor in that community. People finally realized that tourism may be the salvation.

The harbor of refuge that was scorned a few years ago as being not so important because of taconite exports now has become a focal point of development. What has happened in this community, the United Steel Workers of America Union are contributing their labor to build a breakwater. Retired, unemployed and currently employed workers are going to be providing free the labor.

The city somehow, despite all of its economic problems, has raised $100,000 to put forward for this project. The mining company, despite its production being cut by more than 60 percent, is contributing stone, the earth-moving equipment, some land area. They are putting huge earth-moving machines at the service of the community.

All they are looking for is to be reimbursed for the fuel costs. The community has scaled down what the Corps designed many years ago as an eight foot depth project and a million dollar cost down to half that, about $450,000, and a six foot channel depth.

I don't expect you to retain all those details, but I mention them just to show the measure of effort this community is making to develop just this little spark, this little ray of hope that can attract jobs and industry in the recreational boating sector which has grown substantially all along Lake Superior.

From a point just south of Silver Bay to Grand Marais up on the Canadian border, without this harbor of refuge we have a 90 mile segment of that treacherous Lake Superior shoreline unprotected, without a harbor of refuge available.

I know how difficult it is to balance all these requests. You have a schedule today which is only one of many days, big enough to choke a horse and you try to accommodate the interests of all the Members.

This one I say has crucial significance for this area of my district.

Finally, I urge the committee to stick to its guns in the language included in your report last year on the environmental management for the Upper Mississippi. I have supported Locks and Dam 26 but we feel also that the environmental work that must be done, should go forward. The Corps of Engineers, Mr. Chairman, is not complying with the report language this committee wrote in last year directing the equal effort be made on both the design and engineering for second stage Lock and Dam 26 and for the mitigation work to be done on the Upper Mississippi.

People feel very strongly about that very precious stretch of river. We would like for you to keep the heat on the Corps and make them live up to the words this committee wrote into its appropriation bill last year.

Mr. BEVILL. Very good. Jim, you have testified about three projects really.

Mr. OBERSTAR. Yes.

Mr. BEVILL. Are these listed in the order of preference? You have got the Duluth/Superior Harbor, you have the Silver Bay Harbor,

you have the Upper Mississippi master plan and the district heating and cooling program.

Mr. OBERSTAR. The preferential project, the one that is of most immediate significance is the Silver Bay Harbor of refuge.

Mr. BEVILL. That is the breakwater and channel dredging?

Mr. OBERSTAR. Yes, sir.

Mr. WATKINS. No questions.

Mr. BEVILL. We will certainly do what we can to accommodate you, Jim. We appreciate your fine testimony.

Mr. OBERSTAR. Thank you very much, Mr. Chairman.

Congratulations to you on the splendid full launching of the Tennessee Tombigbee which has been a dream project of yours for many years. It was wonderful to see that story in the National Geographic that paid justifiable tribute to you for the leadership you have given to that project.

Mr. BEVILL. Thank you. I appreciate that.

I can sympathize with you about the unemployment, too. I have a steel plant in my district. I am hoping that the Administration will tighten up on the question of fair trade. We all believe in free trade, but we have got to start pushing some fair trade. You know, the textile bill passed overwhelmingly to give that industry five years to get back on its feet and it was vetoed and the veto will be voted on August the 6th.

Now, if the negotiations in July are like they have been in the past with the foreign countries with just watered-down amounts of nothing, I think the Congress is going to override the veto.

Mr. OBERSTAR. I certainly hope so.

Mr. BEVILL. If they do, then I think this will open the door where we can get steel and some of these other industries back on their feet.

Mr. OBERSTAR. We have no better example than in the specialty steel sector where during the Carter Administration imports occupied 80 percent of the domestic market. President Carter put on the quotas for a three-year period of time, turned it around, regained 9,000 jobs in specialty steels and they are back on their feet and they are back up to 80 percent of the market.

There is no reason—with a stroke of the pen this President could do the same thing for the overall steel industry. It does not make sense to abandon that industry.

Mr. BEVILL. I think the vote on that bill is indicative the Congress is getting concerned about the unfair treatment that we are getting on international trade, don't you?

Mr. OBERSTAR. I thought the vote on the textile bill was an overwhelming reaffirmation of the basic good sense of the American people. We want jobs in America, not overseas. We are willing to compete fair and square, but not when the other guy has a competitive advantage. I can't understand the United States continually giving away whole segments of our domestic industry.

Mr. BEVILL. And that is what we are doing. Well, thank you very much, Jim, for your fine testimony.

Mr. OBERSTAR. Thank you for your strong support on the steel matter, as well, Mr. Chairman.

[The statement of Mr. Oberstar follows:]

STATEMENT OF HON. JAMES L. OBERSTAR
to the SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT
COMMITTEE ON APPROPRIATIONS
April , 1986

Mr. Chairman, and Members of this distinguished Committee, I appreciate the opportunity to appear before you today to request your attention to several needed projects of concern to my District, and to the people of Minnesota.

SUMMARY

DULUTH/SUPERIOR HARBOR	$180,000 Survey $5 million Operations and Maintenance
SILVER BAY HARBOR OF REFUGE	$675,000 for breakwater and channel dredging
UPPER MISSISSIPPI RIVER MASTER PLAN	$2 million
DISTRICT HEATING AND COOLING PROGRAMS	

DULUTH/SUPERIOR HARBOR

The Corps of Engineers has requested $180,000 from the Surveys account for continuation of planning and engineering for the Duluth/Superior harbor.

The Corps has also requested $5,471,000 under the O&M account for maintenance dredging and on-going entry pier repairs, for the Marine Museum in Duluth, and for other necessary operations costs.

I strongly support this request, and urge that it by approved by your Committee.

SILVER BAY/BEAVER BAY HARBOR OF REFUGE

This Harbor of Refuge was authorized by the Rivers and Harbors Act of 1945 (PL 97-14).

Mr. Chairman, I have appeared before this Committee virtually every year since I was first elected to Congress in 1974, requesting funding for this project. When last I appeared before you, I requested $1.7 million for the first of a two-year, almost $3 million project.

Today I'm delighted to request only $675,000 as the total federal contribution toward a project which will provide the only shelter for boaters along a 90-mile stretch of steep, rocky coastline and treacherous water of Lake Superior, and enhance this area's search for economic diversity.

The City of Silver Bay has redesigned the project at a much reduced price, and has set aside $100,000 of its own citizens' money as

an indication of how important this project is to them.

Additionally, the United Steelworkers of America will donate their labor, and the area's major employer, Reserve Mining Company, will donate equipment and asks only to be reimbursed for out-of-pocket costs, primarily for fuel.

Construction of the Harbor of Refuge at Silver Bay/Beaver Bay has been studied and recommended for over 10 years. This proposed harbor is an important link in the system of Harbors of Refuge along the North Shore of Lake Superior.

The need for this project has increased tremendously in the intervening years, during which boating use on western Lake Superior has more then doubled. In 1977, commercial and public marinas and yacht clubs included an estimated 13 facilities with 930 seasonal and 10 transient slips. By 1984, the same western Lake Superior region included 18 facilities with 1,557 seasonal slips and 148 transient slips.

Northeastern Minnesota and Minnesota's North Shore have been in economic transition over the last 10 years and more, moving away from dependence on iron ore mining and processing, logging and shipping, toward an increased emphasis on the recreation and tourism industry. Silver Bay itself is the home of Reserve Mining Company, one of the major companies converting low-grade iron ore from the Mesabe Iron Range into high-grade taconite pellets for American steel mills. The company, the town and its residents have suffered deeply from the long-term deterioration of America's steel industry.

Iron ore's most promising replacement industry along the entire North Shore, recreation and tourism, is based on other natural resources of the region and is especially related to one major component -- Lake Superior and its shoreline.

However, while the rugged, rocky cliffs and shoreline of the Noroth Shore provide scenic boating and fishing opportunities, they offer few natural harbors or man-made boater facilities. The 90-mile coastline between Knife River and Grand Marais currently provides no Harbor of Refuge, full-service marinas or transient docking facilities.

The City of Silver Bay is planning to develop the harbor of refuge, as well as boating facilities in three separate subprojects. The first subproject will be the construction of a 550-foot breakwater for the harbor.

The Corps' estimated cost, including engineering, design and supervision, per the Detailed Cost Estimate (escalated to 1985 price levels) totals $2.3 million.

Through a cooperative effort involving the City of Silver Bay, the Reserve Mining Company, the United Steelworkers of America, the Minnesota Department of Natural Resources, and Lake County, it is estimated that the cost of the breakwater could be reduced to

approximately $350,000. The City of Silver Bay has set aside approximately $100,000, and will need about $250,000 in federal participation.

The second phase of the project will be channel restoration to provide a harbor and mooring area with minimum water depth of 6 to 8 feet. The escalated Corps of Engineers' Detailed Cost Estimate projects a cost of slightly over $1 million for this phase. To reduce this cost, the community decided to dredge to a depth of 6 feet instead of 8 wherever possible. A total of $425,000 in federal funding will be needed for this aspect.

The third subproject will be construction of a marina within the Harbor. Funding will be obtained through a combination of state, regional and local public agency support.

As you can see, this project has the full and enthusiastic support of the community, business and labor, the region and the state. A small federal match will make possible a major contribution to safety for a rapidly growing number of boaters, and an invaluable adjunct to the local economy trying to escape its traditional dependence on iron ore mining and processing.

I urge you to support this request.

UPPER MISSISSIPPI RIVER BASIN MASTER PLAN

Mr. Chairman, your Subcommittee in the past as been most helpful in crafting and supporting language to implement the clear intent of P.L. 95-502, which led to the Comprehensive Master Plan for the Management of the Upper Mississippi River System. The Master Plan firmly linked expansion of the navigational capacity on the Upper Mississippi to prevention or mitigation of any resulting environmental damages. H.R. 6, the Water Resources Conservation, Development, and Infrastructure Improvement and Rehabilitation Act of 1986, which I dearly hope will be taken up in conference in the near future and enacted this year, would authorize both the second lock at Lock and Dam 26 and the Environmental Management Plan for the Upper Mississippi.

Your Subcommittee has, in previous legislation and report language, continued that link, and we are deeply grateful to you for recognizing the need to do so. In fact, the Conference Report to accompany the 1985 Supplemental Appropriations Act directed that

> "initial planning and design of the navigation and environmental improvements are to be undertaken simultaneously on equal fiscal footing, to the extent practicable and engineeringly feasible. This process represents a commitment to the balanced use, development and protecton of the river resources recommended for the management of the Upper Mississippi River system in pending authorizing legislation."

Now, despite this clear mandate from Congress, the Corps has

requested $2 million for the lock, and only $1 million for the Environmental Management Plan. This 2-to-1 discrepancy in Fiscal Year 1987 will have disastrous impacts in later years. The Corps, in its Upper Mississippi River System Environmental Management Program, released in January, 1986, identified the need for $3.95 million in fiscal year 1987, as a prelude to almost $20 million per year for fiscal years 1988 through 1991. I do not know what out-year figures the Corps intends, as follow-up to a $1 million request, or how these compare with projections for lock construction, but I do greatly fear that the language of PL 99-88 has been disregarded.

I realize the extreme difficulty your Committee will experience in funding the many requests presented to you, but I do urge that you hold the Corps to the language of PL 99-88, and preserve the balance between navigation expansion and environmental protection. The country cannot afford to lose the environmental values of the Upper Mississippi, any more than it can afford to betray the very strong intent of Congress to link the second lock to the Environmental Management Plan. Nor can we afford to break the coalition which was hammered together between federal agencies, five states, navigation, environmental and many other interests, in support of both the lock and the environment. If we lose the Upper Mississippi, we may well lose support for the lock as well.

DISTRICT HEATING AND COOLING PROGRAMS

District Heating and Cooling Programs continue to be an underdeveloped answer to high energy costs and the nation's need for energy consrvation. District heating can achieve 85-90% fuel efficiency, and such systems can be cost-effective in 48 states. By comparison, kinetic energy derived from an electric turbine uses only 30% of the energy potential of a conventional fuel burn. District Heating harnesses the remaining by-product which would otherwise be released into the atmosphere or waterways as waste.

Minnesota has been a pioneer in the use of District Heating and Cooling. Furthermore, my home area, the Mesabi Iron Range, has some of the largest residential systems in the world. In Virginia, Minnesota, 90% of the commercial district and 75% of the residential segments are linked to the community's system. It claims the largest number of metered customers of any district heating system in the world, and it has been so successful that plans are underway to expand operations.

Yet if District Heating and Cooling is the answer to our nation's energy ills, why has it not become a viable option in the United States as it has across Europe? Two reasons: First, most city planners are not aware of the existence of advantages of the system. Secondly, the initial capital needed to establish a plant is significant. But once a plant is operable, cities can save money by using waste heat.

As the principal sponsor of H.R. 1507, legislation to provide tax incentives to individuals wishing to invest in district heating equipment, I urge the Committee's support of progams thrughout the nation. District Heating has the potential to set a precedent in this nation's quest for energy independence which cannot be ignored.

Mr. Chairman, I appreciate the opportunity to be here today, and to state my support for the above projects.

WEDNESDAY, APRIL 9, 1986.

TVA PROGRAMS

WITNESS

R. NEIL SAMPSON, EXECUTIVE VICE PRESIDENT, AMERICAN FORESTRY ASSOCIATION

Mr. BEVILL. All right. Mr. Neil Sampson, we will be glad to hear from you and you may just proceed as you wish.

Mr. SAMPSON. Thank you, Mr. Chairman. I am Neil Sampson of the American Forestry Association.

I am here to testify today on behalf of the Tennessee Valley Authority. Our organization has supported TVA from its inception through the distinguished service history that it has given to the people of the valley and the people of the nation.

We think that much of its effectiveness has been due to the national resource management programs, the economic development programs, the recreational, educational programs of the TVA and we would suggest that the President's budget proposals to eliminate those are both shortsighted to the region and to the nation and we would testify in opposition to the deletion of those programs, Mr. Chairman.

We believe particularly in forestry and agriculture that TVA has contributed greatly to the science and knowledge both in the region and outside, not just the millions of trees that have been planted as a result of their education which are now a very strong mainstay of the economy of the valley, but the types of things we have learned from TVA as sort of a national experimental model in many ways in forestry and conservation have spread far and wide.

We feel those benefits are national in scope and very much worth the cost of these programs. TVA has been working very diligently as I am sure you are well aware, with the USDA, with the universities, with the State agencies in problems of soil erosion, soil conservation in that valley and through this natural resource problem have done some demonstration projects and provided some leadership in that area that the other agencies and the localities, the conservation districts and others have found invaluable.

It has been a very important part and a very timely part of their particular program. They have also done a tremendous amount of water field work down there both in terms of water quality and in terms of water monitoring methods. Methods that they have helped develop and information they have helped develop has been invaluable to both the State water quality agencies and the other programs down there.

They have done similar things, as you are well aware, in air quality research and we think their environmental education program in that region is just tops and commend them greatly for it.

Finally, Mr. Chairman, the Land Between the Lakes, we support the continuation of that particular area. One of our past presidents who is a professor of environmental programs at the University of Vermont went down there and I would like to just quote what he says.

He says,

On the whole timber harvesting at Land Between the Lakes is superior to that being done on any other private or public lands in the region. It is an excellent demonstration of environmentally sensitive logging in a multiple use area.

Everywhere across the country today we have public land managers inviting the public on to the public lands and unfortunately the public expects a park and what they run into is a national forest which is being used for the production of timber and other commodities and we have got a clash of expectations now which is causing us a tremendous amount of trouble and in many of the forest plans around the country.

Efforts like TVA has done to demonstrate how to mix tourism, recreation, education and sound forest management with forest use are tremendously important to the nation and we commend them for what they have done at Land Between the Lakes.

We want to go on record, Mr. Chairman, supporting a continuation of their last year's budget effort. We realize the times we are in. We realize it is no time to talk about expansion but we would be definitely in opposition to the limitation of those programs as the budget provides.

Mr. BEVILL. Yes. Well, I certainly personally concur with you, too. I think it is false economy to just stop maintenance of the building and all the Lands Between the Lakes. I think it would be a tragedy. It certainly would.

If we follow the budget that is what will happen.

Mr. SAMPSON. Well, those proposals are being driven by dollar considerations rather than policy.

Mr. BEVILL. Certainly not the long-range as you say, they are not looking to the long range.

Thank you very much for a very fine presentation.

Mr. SAMPSON. Thank you, Mr. Chairman.

[The statement of Mr. Sampson follows:]

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Subcommittee on Energy and Water Development

Subject: TVA Appropriations, April 9, 1986

Witness: R. Neil Sampson, Executive Vice President

AMERICAN FORESTRY ASSOCIATION
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Statement of

R. Neil Sampson
Executive Vice President

to the

House Committee on Appropriations

Subcommittee on Energy and Water Development

April 9, 1986

The American Forestry Association, the national citizen's organization for trees, forests and forestry, is distressed by the proposed elimination of the natural resource programs of the Tennessee Valley Authority. We thank you for the opportunity to testify in support of the innovative and cooperative research, management, and educational efforts of the TVA.

The TVA has a distinguished history of service to the people and the resources of the Valley, much of which has been due to the effective natural resource, economic and agricultural development programs of the agency. These programs often lead to the development of technologies, natural resource management techniques, and recreational and educational opportunities which benefit the entire country. To suggest — as the President's Budget Proposals do — that such programs are beyond their usefulness, or that there is no longer any need for them in the Valley, is shortsighted. Many of the resource and economic challenges with which the TVA has wrestled are now facing other regions of the country; TVA's cooperative, yet non-duplicative, interactive relationship with other federal and state agencies continues to be a useful model for the nation.

The TVA Act gave the agency broad responsibilities and fostered an integrated approach to resource management. We would like to highlight examples of TVA's contributions to the environment and natural resources of the region, and the nation as well. For convenience, we will group these efforts and accomplishments into the following general resource categories: forestry and agriculture; water; wildlife; air quality research; and environmental education, although specific programs obviously benefit many if not all of these broad areas.

In addition, We would like to address the importance of Land Between the Lakes, the national recreation and environmental education center which benefits over two million visitors annually, and which in many ways exemplifies the broad accomplishments of the agency.

Forestry and Agriculture. The science and practice of forestry has benefitted greatly, as has the region's economy, from TVA's reforestation and

forest management research and leadership. Millions of trees were planted because of TVA education and outreach to private landowners. Those trees are now a major factor in the economy of the Valley. And TVA reforestation efforts benefit the federal government as well — in an emergency effort requested by the USDA-Forest Service, TVA recently aerially seeded and fertilized 471 acreas of the Pisgah National Forest, after the Forest Service had been unable to locate experienced contractors who could respond promptly.

Today, the country faces the challenge of too many acres of marginal acres in crops; a national problem of such scope that the conservation provisions of the 1985 Farm Bill alone will not be able to completely manage it. Currently, TVA, USDA, State, universities, and other organizations conduct cooperative soil and water conservation programs in the region. TVA's continued leadership, outreach and program support in conservation is needed in the coming years to help address this crucial resource problem.

Water. TVA's effort to provide a surface water quality monitoring and trends assessment—to help TVA manage its reservoirs— provides information for State discharge permits, and acts as an early warning system for emerging water quality problems. TVA cooperates with States, and federal agencies such as the the Soil Conservation Service, and the Environmental Protection Agency to address non-point source pollution and toxic water contamination from surface mining, agriculture, livestock operations and other sources.

In 1985, for example, TVA completed a major national demonstration, the First Tennessee Development District groundwater project, which provided local officials with information needed to protect healthy water supplies in an eight-county area dependent on wells and springs. In addition, TVA prepared a detailed report on the project — including educational materials for use in similar groundwater protection efforts elsewhere. .

Air Quality Research. TVA is taking significant steps to develop and implement pollution control technologies for its power plants, concepts which are appropriate for other power generators as well. TVA is also conducting important studies on the effects of air quality—specifically acid precipitation— on soils, forests, fisheries, and water quality. In the Southern Blue Ridge Province, TVA is participating in an examination of spruce/fir forests for clues about the extent and severity of productivity declines — declines which some scientists link to air pollution or "acid rain." If allowed to do so, TVA will no doubt continue to be an important cooperator in the effort to understand both the cause of acid precipitation, and its impacts on forest and aquatic resources.

Environmental Education. In addition to the educational activities that it operates on its own lands, TVA has established a network of 10 functioning cooperative centers at Valley universities that provide teacher training, educational programs, research, and environmental study areas. This model for environmental education is now spreading to universities outside the Valley, and States as far away as North Dakota and Montana have worked to establish similar programs.

The Land Between The Lakes. Land Between The Lakes provides a national demonstration in integrated natural resource management, providing wildlife, recreation, and education benefits. It receives visits from over two million people a year who come to hunt, fish, camp, observe wildlife, or just to "get away". These visitors leave with a renewed understanding and appreciation of their natural environment.

Land Between The Lakes is a fitting symbol of the multipurpose, imaginative approach which is characteristic of the agency today. AFA Past President, Dr. Carl Reidel, Director of the University of Vermont's Environmental Program, has observed that, "On the whole, timber harvesting at LBL is superior to that being done on other public or private lands in the region — an excellent demonstration of environmentally sensitive logging on a multiple-use area."

The history of TVA is a proud one, and its work and future contributions are far from complete. Per capita income of this region still lags behind the national average, and national investments, in the development and improved utilization of the region's resources, through a proven performer like TVA, are an important key to helping the region close the gap. Furthermore, TVA provides information and models of cooperation which can help combat resource problems at the national level.

We thank you for the opportunity to share these views with you today. We hope, as this Committee assists in the development of the 1987 budget, you will continue to take the value of this organization, both to the region and to the Nation, into consideration.

WEDNESDAY, APRIL 9, 1986.

BEDFORD, IOWA, DAM

WITNESS

HON. JIM LIGHTFOOT, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF IOWA

Mr. BEVILL. Our good friend and colleague, Congressman Jim Lightfoot is in now. We will hear from you, Jim. Be glad for you to just proceed as you wish.

Mr. LIGHTFOOT. Thank you, Mr. Chairman.

I appreciate the opportunity to testify before your subcommittee on the critical problem faced by the community in my district of Bedford, Iowa and what is called the 102 river dam. The City of Bedford soon stands to lose not only the dam, but also their water treatment plant and a couple of bridges all of which are located directly behind the dam.

My purpose for testifying here this morning is to emphasize the need for some quick action to prevent a catastrophe and to show that this problem is largely a Federal responsibility at this point.

I think the best way to outline the problem is to read to you part of a letter from Mr. Clifton Hanshaw who served as a Mayor of Bedford for 25 years. He has been in that community almost his entire life and a portion of his letter reads, I quote,

> I was mayor of this city when the river project was initiated, watched the straightening of the river and watched its completion. I feel I know almost every nook and cranny of that river. The low head dam was built by the City of Bedford in 1922.

It was built on a solid rock foundation. Before the river was straightened, there was no erosion or damage to the dam whatsoever.

The river straightening work that he refers to was done by the Corps of Engineers. I believe it was completed in 1967.

He went on to say that,

> After the project was completed, the velocity of the water so increased to the point that neither rip rap nor anything else will stay in place. This high speed water has worn and torn out the rock foundation that the dam is sitting on. It has eroded the river banks and the water is now being contained in the river channel by wooden planks supported by steel stakes.

He concluded,

> I watched this water do its damage at the dam and water plant and even upstream . . . and I really believe that the city will lose the water plant and I believe the bridges . . . will be in danger.

In addition to losing the dam, the water treatment plant, and possibly the bridges, the city will also be left without any kind of water supply. They are in an area that well water is really a very poor quality so this is quite critical to them.

As a result, I think this thing has reached a critical point. The temporary measures such as the rip rap and the planks are no longer of any use. It is time to take major action before all is lost. The Army Corps of Engineers has been helpful and cooperative in working with the city to study and alleviate the problem in the past, but at this point in time the Corps claims the scope of the

current problem is beyond their emergency authority which was provided by the Public Law 84-99.

They say that is true because the use of emergency funds has to be justified on an eminent failure basis. Mr. Chairman, based on statements from Bedford City officials, the engineer's report and pictures that show a hole in the dam I find it is hard to deny such a status to the dam at this point in time.

In fact, the Corps itself in answering questions in the oversight hearings earlier this year stated, and we will quote from their report, "The scour hole will probably continue to increase in size and may undermine the dam resulting in its total failure."

The Corps estimates that costs to permanently repair the dam would be somewhere from one to two million. Of that they said the city would be required to pay at least 35 percent. On top of that the city would be required to pay 50 percent of the cost of a detailed study which the Corps estimates would cost $80,000.

We find this quite difficult to justify for a couple of reasons. First of all, the city insists the Corps' river-straightening work and the increased water velocity is the cause of the scour whole which is eroding through the dam. The Corps acknowledges that this is possible in their answer to a question from the oversight hearings and they again stated—and this is their words, "Degradation at the structure may have been affected by the Corps' project completed in 1967," end of quote.

Another reason we find cost sharing unjustified in this particular case is the city has already spent a substantial sum on repairs thus far. Since 1965, shortly before the Corps' river straightening project was complete, the city had spent a total of $72,656 and that total does not include expenses that the city was unable to separate from other city expenditures.

Now, this may not seem like a large sum here in Congress where we spend hundreds of billions every year, but it does mean a lot to a city of 1600 people in the heart of the country that is hit hardest by the depressed farm economy.

As the Bedford City clerk stated, "This amount may not be sizeable to you, but it represents many things that a small town has done without in order to pay for the river expenses in trying to keep their water and sewerage treatment plants intact due to the straightening of the river."

In conclusion I would like to urge my colleagues to support quick action to keep the City of Bedford in position where they can avoid millions of dollars in losses due to a problem which the Federal Government has obviously had a hand in creating. Particularly I want to emphasize my strong belief that the city is a victim in this case and it would be unconscionable in my opinion to force the City of Bedford to share any of the resulting costs.

As a member of the Committee on Public Works and Transportation, I look forward to working in conjunction with your committee to see this problem gets addressed as soon as possible.

Thank you, Mr. Chairman, for this opportunity to come before you this morning. If you have any questions I will be glad to answer them.

Mr. MYERS. Thank you, Jim.

Mr. BEVILL. Thank you for a fine presentation and we will certainly work with you to do the best we can.

Mr. LIGHTFOOT. I think the main point that needs to be made is that the Corps has been very cooperative with the city in the past, but they have decided their emergency authority does not go far enough because they say it has to be an eminent danger, yet we submitted some questions to them and in their written response they have accepted part of the responsibility for causing the problem. That little town right now, is basically broke because they are right in the heart of where the depression in agriculture is the worst.

The county is relatively poor. The land is not very good to start with. It is cow country and the cows are gone and they are really between a rock and a hard place. I think the Corps would be willing to go ahead and do something but they feel like the definition in that emergency authority has stopped them at this point. So it is not an argument between the city and the Corps, but between this regulation and if you could see your way fit——

Mr. MYERS. What is the estimate on the cost?

Mr. LIGHTFOOT. I said one to two million.

Mr. MYERS. That is a big difference there.

Mr. LIGHTFOOT. See, our whole country went through a lot of river straightening back in the mid-sixties and their water treatment plant sits right at the edge of where this dam was in place. Before they straightened the river it was no problem, but once they straightened it the water flow increased to a higher rate of speed which started to undermine the dam. They have tried rip rap, they have put planks, tried a number of things.

In fact, the Corps has helped with that, but they are just not getting the erosion cut down. It looks like the only opportunity is to get the corps to handle the accelerated flow of water which it didn't have in the beginning. The way it was designed originally was okay, but the Corps straightened the river which added to the problem.

If the dam goes they are going to lose their water treatment plant and they have no money to replace that.

Thank you.

[The statement of Mr. Lightfoot follows:]

THANK YOU MR. CHAIRMAN. I APPRECIATE THIS OPPORTUNITY TO TESTIFY BEFORE THE SUBCOMMITTEE THIS MORNING ON THE CRITICAL PROBLEM FACED BY THE COMMUNITY OF BEDFORD, IOWA, WITH THE 102 RIVER DAM. THE CITY OF BEDFORD SOON STANDS TO LOSE NOT ONLY THIS DAM, BUT ALSO ITS WATER TREATMENT PLANT AND A COUPLE OF BRIDGES, ALL OF WHICH ARE LOCATED DIRECTLY BEHIND THE DAM. MY PURPOSE FOR TESTIFYING HERE THIS MORNING IS TO EMPHASIZE THE NEED FOR QUICK ACTION TO PREVENT A MINOR CATASTROPHE AND TO SHOW THAT THIS PROBLEM IS LARGELY A FEDERAL RESPONSIBILITY.

I BELIEVE THAT THE BEST WAY TO OUTLINE THE PROBLEM IS TO READ TO YOU PART OF A LETTER FROM MR. CLIFTON HANSHAW, WHO SERVED AS MAYOR OF BEDFORD FOR 25 YEARS AND HAS LIVED IN THE COMMUNITY FOR ALMOST HIS ENTIRE LIFE. HIS LETTER READS:

"I WAS MAYOR OF THIS CITY WHEN THE RIVER PROJECT WAS INITIATED, WATCHED THE STRAIGHTENING OF THE RIVER, AND WATCHED ITS COMPLETION. I FEEL THAT I KNOW ALMOST EVERY NOOK AND CRANNY OF THAT RIVER."

"THE LOW HEAD DAM WAS BUILT BY THE CITY OF BEDFORD IN 1922. IT WAS BUILT ON A SOLID ROCK FOUNDATION. BEFORE THE RIVER WAS STRAIGHTENED, THERE WAS NO EROSION OR DAMAGE TO THE DAM WHATSOEVER."

THE RIVER STRAIGHTENING WORK HE REFERS TO WAS DONE BY THE ARMY CORPS OF ENGINEERS.

MR. HANSHAW GOES ON TO SAY:

"AFTER THE PROJECT WAS COMPLETED, THE VELOCITY OF THE WATER SO INCREASED TO THE POINT THAT NEITHER RIP RAP NOR ANYTHING ELSE WILL STAY IN PLACE. THIS HIGH SPEED WATER HAS WORN AND TORN OUT THE ROCK FOUNDATION THAT THE DAM IS SETTING ON. IT HAS ERODED THE RIVER BANKS AND THE WATER IS NOW BEING CONTAINED IN THE RIVER CHANNEL BY WOODEN PLANKS SUPPORTED BY STEEL STAKES."

HE CONCLUDES BY SAYING:

"I HAVE WATCHED THIS WATER DO ITS DAMAGE AT THE DAM AND WATER PLANT AND EVEN UPSTREAM..... AND I REALLY BELIEVE THAT THE CITY WILL LOSE THE WATER PLANT AND I BELIEVE THE BRIDGES...WILL BE IN DANGER."

IN ADDITION TO LOSING THE DAM, THE WATER TREATMENT PLANT, AND POSSIBLY THE BRIDGES, THE CITY WOULD ALSO BE LEFT WITHOUT A WATER SUPPLY.

AS YOU CAN SEE, THE CITY'S PROBLEM HAS REACHED A CRITICAL POINT. TEMPORARY MEASURES SUCH AS RIP RAP AND PLANKS ARE NO LONGER OF ANY USE, AND IT IS TIME TO TAKE SOME MAJOR ACTION BEFORE ALL IS LOST.

THE ARMY CORPS OF ENGINEERS HAS BEEN HELPFUL AND COOPERATIVE IN WORKING WITH THE CITY TO STUDY AND ALLEVIATE THE PROBLEM IN THE PAST. HOWEVER, THEY CLAIM THAT THE SCOPE OF THE CURRENT PROBLEM IS BEYOND THEIR EMERGENCY AUTHORITY PROVIDED BY P.L. 84-99 BECAUSE THE USE OF EMERGENCY FUNDS HAS TO BE JUSTIFIED ON AN

IMMINENT FAILURE BASIS. MR. CHAIRMAN, BASED ON STATEMENTS FROM BEDFORD CITY OFFICIALS, THE ENGINEER'S REPORT, AND THE PICTURES SHOWING THE HOLE IN THE DAM, I FIND IT HARD TO DENY SUCH A STATUS TO THIS DAM. THE CORPS ITSELF, IN ANSWERING QUESTIONS FROM THE OVERSIGHT HEARINGS EARLIER THIS YEAR, STATED, "THE SCOUR HOLE WILL PROBABLY CONTINUE TO INCREASE IN SIZE AND MAY UNDERMINE THE DAM RESULTING IN ITS FAILURE."

THE CORPS ESTIMATES THAT COSTS TO PERMANENTLY REPAIR THE DAM WOULD TOTAL ANYWHERE FROM $1 TO $2 MILLION. OF THAT, THEY SAID THE CITY WOULD BE REQUIRED TO PAY AT LEAST 35 PERCENT. ON TOP OF THAT, THE CITY WOULD BE REQUIRED TO PAY 50 PERCENT OF THE COST OF A DETAILED STUDY, WHICH THE CORPS ESTIMATES WOULD COST $80,000. I FIND THIS DIFFICULT TO JUSTIFY FOR A COUPLE OF REASONS. FIRST OF ALL, THE CITY INSISTS THAT THE CORPS' RIVER-STRAIGHTENING WORK AND THE INCREASED WATER VELOCITY IS THE CAUSE OF THE SCOUR HOLE WHICH IS ERODING THROUGH THE DAM--AND THE CORPS ACKNOWLEDGES THAT THIS IS POSSIBLE IN THEIR ANSWER TO A QUESTION FROM THE OVERSIGHT HEARINGS, IN WHICH THEY STATE, "DEGRADATION AT THE STRUCTURE MAY HAVE BEEN AFFECTED BY THE CCRPS PROJECT COMPLETED IN 1967."

ANOTHER REASON I FIND COST SHARING UNJUSTIFIED IN THIS PARTICULAR CASE IS THAT THE CITY HAS ALREADY SPENT A SUBSTANTIAL SUM ON REPAIRS THUS FAR. SINCE 1965, SHORTLY BEFORE THE CORPS' RIVER-STRAIGHTENING PROJECT WAS COMPLETE, THE CITY HAS SPENT A TOTAL OF $72,656. AND THAT TOTAL DOESN'T INCLUDE EXPENSES THAT THE CITY WAS UNABLE TO SEPARATE FROM OTHER CITY EXPENDITURES. THIS MAY NOT SEEM LIKE A LARGE SUM HERE IN CONGRESS WHERE WE SPEND

HUNDREDS OF BILLIONS EVERY YEAR, BUT IT MEANS A LOT TO A CITY OF 1600 PEOPLE IN THE HEART OF THE COUNTRY HID HARDEST BY THE DEPRESSED FARM ECONOMY. AS THE BEDFORD CITY CLERK STATED, "THIS AMOUNT MAY NOT BE SIZABLE TO YOU, BUT IT REPRESENTS MANY THINGS THAT A SMALL TOWN HAS DONE WITHOUT IN ORDER TO PAY FOR THE RIVER EXPENSES IN TRYING TO KEEP OUR WATER AND SEWAGE TREATMENT PLANTS INTACT DUE TO THE STRAIGHTENING OF THE RIVER."

IN CONCLUSION, I WANT TO URGE MY COLLEAGUES TO SUPPORT QUICK ACTION TO HELP THE CITY OF BEDFORD AVOID MILLIONS OF DOLLARS IN LOSSES DUE TO A PROBLEM WHICH THE FEDERAL GOVERNMENT HAS OBVIOUSLY HAD A HAND IN CREATING. IN PARTICULAR, I WANT TO EMPHASIZE THAT MY STRONG BELIEF THAT THE CITY OF BEDFORD IS A VICTIM IN THIS CASE, AND THAT IT WOULD BE UNCONSCIONABLE IN MY OPINION TO FORCE THE CITY OF BEDFORD TO SHARE ANY OF THE RESULTING COSTS. AS A MEMBER OF THE COMMITTEE ON PUBLIC WORKS AND TRANSPORTATION, I LOOK FORWARD TO WORKING IN CONJUNCTION WITH YOUR COMMITTEE TO SEE THAT THIS PROBLEM GETS ADDRESSED AS SOON AS POSSIBLE.

AGAIN, THANK YOU, MR. CHAIRMAN, FOR THE OPPORTUNITY TO BRING THIS CASE BEFORE YOUR SUBCOMMITTEE. IF YOU HAVE ANY QUESTIONS, I'D BE GLAD TO ANSWER THEM.

WEDNESDAY, APRIL 9, 1986.

TVA PROGRAMS

WITNESS

GORDON C. ROBERTSON, LEGISLATIVE COUNSEL, INTERNATIONAL ASSOCIATION OF FISH & WILDLIFE AGENCIES

Mr. BEVILL. Mr. Gordon Robertson, you may proceed as you wish.

Mr. ROBERTSON. Thank you, Mr. Chairman.

I am Gordon Robertson, Legislative Counsel for the International Association of Fish and Wildlife Agencies, and I am here today to offer testimony in support of the budget of the Tennessee Valley Authority.

The International Association of Fish and Wildlife Agencies is a quasi-governmental organization of public agencies which possesses legal authority for protection and management of North America's fish and wildlife and their habitats. I will summarize our comments that have been submitted for the record.

The budget reduction proposed by the Administration for fiscal year 1987 of 52 percent is the largest for a Federal natural resource agency. The International Association recommends the following budget restorations so that the following important programs may continue: that the resources program be funded at a level of $4.3 million. The proposed cut of $3.7 million for this program would eliminate TVA's forestry, environmental education, and wildlife programs, including the successful Eagle and Osprey Reintroduction Program.

TVA has effectively combined all of these programs as not only a productive program for the agency but also as a model for other Federal and State agencies to review. It has also been reviewed on site by dozens of foreign natural resource agencies from such countries as Mainland China, and those of Latin America, and some from the Middle East.

We also recommend that the Land Between The Lakes program be funded at a level of $6.9 million. The budget proposes to eliminate this program entirely. This is a premier 170,000-acre recreation area that attracts almost 2 million visitors annually for such experiences as camping, hunting, fishing, wildlife observation, horseback riding, hiking, boating and environmental education.

Wildlife habitat objectives are accomplished through a model forest management program in this area. The Land Between The Lakes program is truly embodying the term "multiple use."

We also recommend that the Water Resources Program be funded at a level of $8 million. This program is proposed for a $4.5 million reduction. The important aspect of this program is the reaeration and minimum flows in tailwaters of TVA's reservoir facilities that keep the oxygen level to acceptable standards for the fisheries resource. This effort will be greatly reduced under the proposed reduction.

Other fisheries improvement efforts will be stopped under the proposed budget reduction. Some examples of the work in this area are enhancement of reservoir fisheries habitat to increase both

commercial and sport fisheries; improvement of the striped bass fishery; restoration of traditional white bass runs into tributaries of TVA's reservoir; and the effort to replace the trout fishery destroyed by construction of the Tellico Reservoir.

The Water Resources Program also makes important contributions in the arena of non-point source pollution from agriculture and surface mine reclamation. This is carried out as a cooperative demonstration between TVA, the States of Tennessee, Kentucky, Mississippi, and the Soil Conservation Service. The proposed budget would eliminate these demonstrations.

Finally, that the Resource Management and Development Program be funded at a level of $4.8 million. The proposed budget reduction eliminates TVA's acid deposition research efforts in cooperation with the National Acid Precipitation Assessment Program, the EPA, and regional States.

Scientists for TVA have pioneered research in atmospheric reactions that create acid deposition. This valuable work continues to add to our knowledge about the effects on fish and wildlife and their habitats.

Also halted would be TVA's low-cost technology wastewater treatment demonstrations for small communities. This assists clean water programs throughout the nation.

In summary, Mr. Chairman, TVA is a Federal agency that does work. It goes far beyond the regional area which most people think of TVA as serving. It has been recognized in the scientific community and in demonstrations, and it has shown in forest management, wildlife management and recreation that it is truly a model.

[The statement of Mr. Robertson follows:]

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Jack H. Berryman, Executive Vice President

COMMENTS OF THE INTERNATIONAL ASSOCIATION OF FISH AND WILDLIFE AGENCIES
BEFORE THE HOUSE APPROPRIATIONS SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT
FOR THE FY 1987 BUDGET OF
THE TENNESSEE VALLEY AUTHORITY
BY
GORDON C. ROBERTSON, LEGISLATIVE COUNSEL

The International Association of Fish and Wildlife Agencies (IAFWA) is a quasi-governmental organization of public agencies which possesses legal authority for protection and management of North America's fish and wildlife and their habitats. Founded in 1902, the Association's government members include the fish and wildlife agencies of all 50 states and most Canadian provinces, as well as the federal fish and wildlife agencies of the United States, Canada and Mexico. The Association has been a key instrumentality in promoting principles of sound resource management and in strengthening federal, state and private cooperation in protecting and managing fish and wildlife in the public interest.

The Tennessee Valley Authority (TVA) is a regional agency that completes work and demonstrations for the natural resource community on a national and international scale. In addition, much of the work done by the TVA is not done by other state or federal agencies. The budget reduction proposed by the Administration for FY 1987, a 52 percent reduction, is the largest for a federal natural resource agency. This reduction, if carried through, will create a void in vital resource programs such as pioneering work in water quality, downstream flows, acid deposition and reservoir management. In addition, TVA's impressive wildlife and forest management programs will come to a standstill. The International Association recommends the following budget restorations so that these important programs may continue.

That the Land and Forest Resources program be funded at a level of $4.3 million. This proposed cut of $3.7 million for this program would eliminate TVA's forestry, enviromental education and wildlife programs, including the successful eagle and osprey reintroduction program. TVA has effectively combined all these programs as not only a productive program for the agency but also as a model for other federal and state agencies. It has also been reviewed on site by dozens of foreign natural resource agencies from such countries as mainland China to those of Latin America and the Mideast.

That the Land Between the Lakes Program be funded at a level of $6.9 million. The budget proposes to eliminate this program. This is a premier 170,000 acre recreation area that attracts almost 2 million visitors annually for such experiences as camping, hunting, fishing, wildlife observation, horse back riding, hiking, boating and environmental education. Wildlife habitat objectives are accomplished through model forest management program. The Land Between the Lakes truely embodies the term multiple-use.

That the Water Resources Program be funded at a level of $8.0 million. This program is proposed for a $4.5 million reduction. An important aspect of this program is the reaeration and minimum flows in tailwaters of TVA's reservoir facilties. Over the past 5 years TVA has developed methods to bring the oxygen level to acceptable standards for fisheries in waters released from several of its reservoirs. This has been extremely beneficial to fisheries production, waster quality and the ability of the waters to assimilate wastes. This valuable effort will be greatly reduced under the proposed reduction.

All fisheries improvement efforts will be stopped under the proposed budget reduction. Some examples of the work in this area are: enhancement of reservoir fisheries habitat to increase both commercial and sport fishing harvests; efforts to improve the striped bass fishery and to restore traditional white bass runs in tributaries to TVA's reservoirs; and the effort to replace the trout fishery destroyed by the construction of the Tellico Reservoir.

The Water Resources program also makes important contributions in the arena of nonpoint source pollution from agriculture and surface mining. This is carried out as cooperative demonstrations between TVA, the states of Tennessee, Kentucky, Mississippi and the Soil Conservation Service. The proposed budget reductions would eliminate these demonstrations. Another significant and successful effort under the Water Resources program area is the toxic contamination clean-up between TVA, the Environmental Protection Agency (EPA), and the states of Virginia, Tennessee and Alabama. This program, at best, will be delayed. The cooperative effort to reclaim abandoned surface mines in North Carolina, Tennessee and Georgia is also under the Water Resources program and would be halted.

That the Resource Management and Development Program be funded at at level of $4.8 million. The proposed budget reduction eliminates TVA's acid deposition research efforts in cooperation with National Acid Precipitation Assessment Program, the EPA and regional states. Scientists for TVA have pioneered research in atmospheric reactions that create acid deposition. This valuable work continues to add to our knowledge about the effects on fish and wildlife and their habitats. Also halted would be TVA's low cost technology waste-water treatment demonstrations for small communities. This program assists clean water programs throughout the nation.

for reasons that are known to us all—private firms have a profit motive; they have an incentive to cut costs and be efficient.

It is clear from this that there is a sound case for privatizing the PMAs. Fortunately, the theory of privatization offers a political strategy to deal with opposition that might arise from such a plan.

Proposals have been made in the past to alleviate the problems of the PMAs and have been soundly defeated. Any realistic proposal will have to take into account at least four important factors: one, demands of the current customers of subsidized power; two, the wishes of taxpayers for a reasonable rate of return on their investment and the end of the subsidies; three, demands of the current employees of the PMAs.

The Administration's recently submitted fiscal year 1987 budget proposal was vague on the details of the proposed sale. They merely stated that they plan to "pursue privatization through an open, competitive process working with the congressional committees, State and local officials, current customers, and all interested parties."

We propose to follow the successful model set in Great Britain. Each PMA would be incorporated, and shares of each corporation sold in the stock market. The Department of Energy has been looking at this proposal, we understand. The sale would be done at market value. A problem with the Administration's proposal is that it considerably understates the value of the PMAs because its estimates are based on historical cost rather than market value.

Historical costs are simply the original costs of the assets. The problem with assessing the value of the PMAs with this method is that it fails in its calculation to take into account inflation and appreciation of the assets in real terms due to changing market circumstances.

A key provision of the plan would be to give preferences to current residential and small business customers along with current employees. This would involve selling stock to them at below-market rates and allowing them first chance at all stock.

In conclusion, we feel that our privatization plan, which we have detailed, would result in a wise and fair deal for both current PMA customers and American taxpayers, and make a significant down-payment on the deficit to help meet the mandate of Gramm-Rudman-Hollings to balance the Federal budget by 1991.

Thank you, and I will be happy to answer any questions you may have.

[The statement of Mr. Smith and attachments follow:]

Mr. BEVILL. Well, I concur with you, and I certainly feel sure this committee is going to take a long, hard look at it before they go along with the recommendation of the budget.

Mr. ROBERTSON. Very good.

Mr. BEVILL. Thank you very much for a very fine statement.

WEDNESDAY, APRIL 9, 1986.

DEPARTMENT OF ENERGY/POWER MARKETING ADMINISTRATIONS

WITNESS

JEFFREY C. SMITH, DIRECTOR, PRIVATIZATION ALLIANCE, CITIZENS FOR A SOUND ECONOMY

Mr. BEVILL. Mr. Jeffrey Smith.

Pleased to have you, Mr. Smith. You may proceed.

Mr. SMITH. I have a couple things, Mr. Chairman, that I want to insert in the record: a paper that I believe the Clerk has.

Thank you, Mr. Chairman, for the opportunity to present our views on the power marketing privatization initiatives. Citizens for a Sound Economy is a 250,000-member grassroots citizens organization in its second year of operation. We take a keen interest in privatization because we believe that, by replacing public sector activities with private sector alternatives, the level and quality of services provided to the American public can be substantially improved while reducing the burden on the American taxpayer.

As the members of this committee are well aware, President Reagan, in his fiscal year 1987 budget proposal, advocated privatizing the five Power Marketing Administrations, PMAs. CSE strongly supports his idea. The operation of the PMAs for the past 50 years has resulted in subsidized power rates for their users at the expense of the average taxpayer.

The PMAs are able to get away with these extravagant subsidies because the Federal Government tolerates the shoddy accounting practices. PMAs pay interest on their debt well below market rates. The PMAs are also not forced to make fixed payments of principal on their debt. As a result, less than 20 percent of the $15.6 billion investment has been repaid.

The waste involved with PMAs will continue as long as the involvement of the Government means that management reacts to the demands of the special interests rather than market forces. For example, BPA was allocated $1.25 billion to satisfy conservation interests, for the ostensible purpose of reducing the demand for PMA power, and used the money for such things as insulating wood-heated homes.

It is not only the taxpayer who must foot the bill for inefficient management. It is also the aluminum industry, and we are all familiar with the WPPSS disaster.

Simply put, Mr. Chairman, there is no economic justification for government involvement in the power generation business. Most of the electricity in this country is already provided efficiently by the private sector. The PMAs, if privatized, would be managed better

/C/S/E/

TESTIMONY OF

JEFFREY C. SMITH

DIRECTOR, PRIVATIZATION ALLIANCE

CITIZENS FOR A SOUND ECONOMY

BEFORE THE

COMMITTEE ON APPROPRIATIONS

ENERGY AND WATER DEVELOPMENT SUBCOMMITTEE

OF THE

U.S. HOUSE OF REPRESENTATIVES

APRIL 9, 1986

CITIZENS FOR A SOUND ECONOMY
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Thank you, Mr. Chairman, for the opportunity to present our views on power marketing privatization initiatives. Citizens for a Sound Economy is a 250,000 member grassroots citizens organization in its second year of operation. We take a keen interest in privatization because we believe that, by replacing public sector activities with private sector alternatives, the level and quality of services provided to the American public can be substantially improved while reducing the burden on the American taxpayer.

As the members of this committee are well aware, President Reagan in his FY1987 budget proposal advocated privatizing the five Power Marketing Administrations (PMAs). CSE strongly supports this idea. The operation of the PMAs for the past 50 years has resulted in subsidized power rates for their users at the expense of the average taxpayer.

The PMAs are able to get away with these extravagant subsidies because the federal government tolerates the shoddy accounting practiced by PMAs. PMAs pay interest on their debt well below market rates. The PMAs are also not forced to make fixed payments of principal on their debt. As a result, less than 20 percent of the $15.6 billion investment has been repaid. A typical example is BPA, whose debt from 1970 to 1984 increased from $2.7 billion to $8 billion, while only repaying $126 million of its debt over that 15 year period. In 1982 and 1983, BPA made no repayments on its debt. Proposals for "repayment reform" have

been defeated for obvious political reasons; reform would mean higher rates which reflect the actual cost of generating power. Voting for such reform is not what gets politicians re-elected.

The result is the same with PMAs as it has been with every public industry -- inefficient management. With the government available to foot the bill, projects have been undertaken regardless of costs or a realistic analysis of future demand. For example, BPA's debt from 1983 to 1986 increased from $7.5 billion to $9.2 billion. This is despite current projections of a surplus of power and the already strained budgetary crisis on the federal level.

The waste involved with PMAs will continue as long as the involvement of the government means that management reacts to the demands of the special interests rather than market forces. For example, BPA was allocated $1.25 billion to satisfy conservation interests, for the ostensible purpose of reducing the demand for PMA power, and used the money for such things as insulating wood-heated homes! It is not only the taxpayer who must foot the bill for inefficient management, however. BPA's involvement in the WPPSS fiasco meant rate increases for the Pacific Northwest; it is estimated that the involvement meant $800 million in additional payments by users and the hard-hit aluminum industry saw its rates increase from 4.51 mills to 25 mills from 1980 to 1985.

Similarily, proposals to sell the PMAs to the states fall short. Transfer of the assets from the federal to the state level would not solve the problems inherent in public provision of services. PMA business decisions would still be made on political, rather than economic grounds with inefficient bureaucratic incentives remaining. Further, such a proposal leaves control of the PMAs not in the hands of customers, but in the hands of state governments.

Simply put, there is no economic justification for government involvement in the power generation business. Most of the electricity in this country is already provided efficiently by the private sector. The PMAs, if privatized, would be managed better for reasons that are known to us all--private firms have a profit motive; they have an incentive to cut costs and be efficient.

It is clear from this that there is a sound case for privatizing the PMAs. Fortunately, the theory of privatization offers a political strategy to deal with opposition that might arise from such a plan.

Proposals have been made in the past to alleviate the problems of the PMAs and have been soundly defeated. Any realistic proposal will have to take into account at least four important factors: 1) demands of the current customers of subsidized power 2) the wishes of taxpayers for a reasonable rate of return on their investment and the end of the subsidies, 3) demands of the

current employees of the PMAs and 4) Congress' need to meet the Gramm-Rudman-Hollings deficit reduction targets by meaningful reductions in federal spending.

The administration's recently submitted FY1987 budget proposal was vague on the details of the proposed sale. They merely stated that they plan to "pursue privatization through an open, competitive process working with the congressional committees, state and local officials, current customers, and all interested parties."

Through our work with other academic and public policy institutions, CSE has developed a plan which we think will fill the gap left by the administration and satisfy all parties concerned. Our proposal would meet the concerns of current customers, provide a good return on the taxpayers' investment and result in greater deficit reduction than proposed in the current budget.

We propose to follow the successful model set in Great Britain. Each PMA would be incorporated, and shares of each corporation sold in the stock market. The sale would be done at market value; a problem with the administration's proposal is that it considerably understates the value of the PMAs because its estimates are based on historical cost rather than market value. Historical costs are simply the original costs of the assets; the problem with assessing the value of the PMAs with

this method is that it fails in its calculation to take into account inflation and appreciation of the assets in real terms due to changing market circumstances.

The market value approach, on the other hand, is an attempt to get at the true value of the assets: the discounted stream of future income expected from ownership of the assets. The difference in approaches can be quite substantial. The Reagan Administration has proposed selling the PMAs for $13.8 billion while more market based approches such as Milton Copulos of Heritage and the Grace Commission have come up with figures ranging from $62 billion to $77 billion. While some skepticism may be voiced on these estimates the privatization experience in Britain has been just the opposite. For example, British Telecom at the beginning of trading saw its stock price rise sharply from an initial sale price of 1.30 pounds to 1.93 pounds on the first day of trading as the expected efficiencies derived from private management were built into the stock price. Initial demand for the stock was so heavy that sales of the stock had to be rationed. For this reason, it is quite probable that these estimates understate and not overstate the value of the PMAs.

A key provision of the plan would be to give preferences to current residential and small business customers along with current employees. This would involve selling stock to them at below-market rates and allowing them first chance at all stock.

This serves several purposes. First, by giving them a stake in the efficient operation of PMAs, it builds a coalition in support of privatization.

Second, it puts the current customers in control of their own destiny; they can choose high electric rates and therefore high dividends from the stock or low rates and low dividends. 2.3 million individuals, all no doubt customers, bought shares of British Telecom. No longer will customers be at the whim of the federal government or suffer the mistakes of public management.

Finally, it gives current employees a positive stake in privatization. Again, the British experience is enlightening. When Britoil was privatized, 92 percent of the employees bought stock; when Cable and Wireless, a state run communications firm was privatized, 99 percent of the employees bought stock.

In conclusion, we feel that our privatization plan would result in a wise and fair deal for both current PMA customers and American taxpayers, and make a significant down payment on the deficit to help meet the mandate of Gramm-Rudman-Hollings to balance the federal budget by 1991. Thank you, and I will be happy to answer any questions you may have.

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CSE CITIZENS FOR A SOUND ECONOMY

ISSUE ALERT

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ANSWERING THE CRITICS: WHY THE FEDERAL POWER MARKETING ADMINISTRATIONS SHOULD BE SOLD

by
Michael Becker
and
Jeffrey C. Smith

The Reagan administration's plan to substantially slash the federal deficit by selling the five Power Marketing Administrations (PMAs) has generated much special-interest outcry. PMA assets include 126 hydroelectric power plants with 622 substations, all owned, operated and subsidized by the federal government. Cheap power generated at these massive federal dams benefits a select 25 percent of the U.S. population.

Recently the American Public Power Association (APPA) published a position paper which, given their stake in the matter, came to the not-too-surprising conclusion that PMAs should not be privatized. However, by and large the paper is seriously flawed. It misrepresents the facts of the issue and appeals to the "public interest" when in fact the federal government's involvement in the power generation business is at the behest of special interests.

The eight arguments made in the APPA paper have been used by other detractors of privatization in slightly different forms. In an effort to set the record straight, CSE presents responses to each below.

1) "Power Dams Pay Their Way and Make Money"

APPA argues that the PMAs are successful revenue-producing enterprises. This ignores their lax repayment policy and subsidized interest rates. The PMAs are not on a fixed repayment schedule under which annual repayments of the original investment are made. For example, from the mid-1960s, when annual repayment requirements were eliminated, to 1984, Bonneville Power Administration's (BPA) repayment as a percentage of cumulative investment fell from 20.2 percent to 8.1 percent.[1] In 1982 and 1983 no repayments were made.[2] The APPA assertion that repayment is on schedule is a distortion; PMAs are allowed to set up repayment schedules reminiscent of creatively financed home mortgages end-loaded with balloon payments. A 1982 BPA repayment schedule projects $2 billion in repayments between now and the year 2015 and then suddenly projects $5.5 billion in additional payments by the year 2022 to amortize the rest of the debt.[3] Through such methods, BPA simply defers the day of reckoning.

The PMAs also receive subsidized interest rates. They are allowed to apply their interest payments against high interest debt first and therefore to roll over their old low interest debt. BPA, for example, was paying around 4 percent interest on its debt in the early 1980s, when interest rates were in double digits. No private creditor would allow such a scheme.

Finally, federal power is not, as APPA asserts, provided "at the lowest cost consistent with sound business principles." Anybody acquainted with PMA practices knows the opposite is true; as the Grace Commission noted, the rules governing PMAs allowed "entire PMA operations to grow outside of the financial spirit of sound business principles"[4] [emphasis in original]. Any assertion that PMAs pay their own way flies in the face of this reality.

2) "Privatization is Driven By Ideology, Not Sound Business Principles"

APPA argues that the administration's budget underestimates the value of the assets. With this, we would agree. The Reagan administration has estimated sale of the assets would bring in $13.8 billion based on historical cost. An estimate based on market value, such as that made by Milton Copulos of the Heritage Foundation, suggests a potential sale price of $62 billion. This only strengthens the case for privatization.

As to APPA's assertion that support for privatization of the PMAs is driven by ideology rather than sound business judgement, one need only point to the previous section which documented exactly how unsound the current business practices of the PMAs are. Decision-makers in the public sector face perverse institutional incentives which prevent them from running government like a business. The only way that sound business judgement can be realized is through privatization. That is why environmental groups, such as the National Wildlife Federation, have endorsed privatization.

3) "PMAs Help Reduce the Deficit"

APPA asserts that, since PMAs will be making interest and debt repayments into the future, PMAs automatically reduce the deficit. In fact, sale of PMAs would result in greater deficit reduction than if they were kept. As APPA itself admits, the historical cost of the assets is less than the market value. This implies that any sale of the asset at market value will reduce the deficit more than future repayments of the original investment. Take the $40 billion sale price of BPA quoted in the APPA study. To reduce the deficit by an equivalent amount the discounted stream of future BPA repayments would have to have a present value of $40 billion. In his proposal to sell BPA to the states being served, Congressman Jim Weaver (D-OR) calculated the present value of the debt service for BPA to be $4.7 billion. The difference of $35.3 billion represents the potential deficit reduction from the sale of PMAs.

In fact, the difference will likely be even greater. It is usually assumed that repayments, at the levels projected, will be forthcoming. However, PMAs have a history of overestimating demand. BPA's past assumption of continued 7 percent growth,[5] for example, was incorrect given the current state of no growth. Debt payments may have been deferred with the expectation that a federal bailout will be forthcoming when they finally come due. Also, a lump-sum payment now will reduce the current level of federal debt and thereby reduce future interest payments to service this debt.

4) "Private Owners Could Not Do a Better Job"

The profit motive which APPA denigrates gives private managers an incentive to cut costs and improve efficiency. Public managers, on the other hand, have a political incentive to subsidize prices both to please their customers ("constituents") and to increase their power and control, which is fostered by increasing the demand for PMA power through low rates.

One should also remember BPA's involvement in the Washington Public Power Supply System (WPPSS) fiasco. BPA, through its net billing agreements, financed a considerable amount of this investment -- a fact which is now reflected in BPA rates. From 1980 to 1985 aluminum companies saw their rates rise from 4.51 mills/kwh to 26 mills.[6] Given the current market surplus in the area, it is questionable whether private investors would have made similar mistakes. Certainly they would have avoided the massive waste represented by construction of the WPPSS power plants.

5) " 'Privatization' Would Boost Rates, and Hurt the Economy"

The following is a comparison of the average PMA price and the marginal cost of electricity in the areas served by the PMAs:

PMA	Average price charged (mills/kwh)	Marginal cost in area (mills/kwh)
Alaska	10	30
Bonneville	17	38
Southeast	9	39
Southwest	14	34
Western	10	47

Source: EIA Memo

While BPA rates have been adversely affected by the increased costs of WPPSS, all PMAs provide considerably cheaper power than could be received if the users relied on other sources or happened to live in the Northeast.

Would privatization raise rates? In the areas currently receiving subsidized rates, the answer is probably yes. Privatization would mean the end of subsidized rates. The impact of local rate increases, though, could be offset by several factors. First, privatization would bring better management which would reduce costs. Second, proposals for privatization, such as a common stock offering, have included features such as sale to current customers at a discount.

The threat of a "long-term depression" in the Pacific Northwest is a red herring. No doubt adjustments will have to be made (and are being made) in industries, particularly the aluminum industry, to reflect the realities represented by market prices. The original cause of the problem should be pointed out, though. Any time the federal government distorts prices, decisions and plans based on those prices will have to be altered when prices are restored to realistic levels. The answer is not further government distortions.

6) "Plan Would Dump Assets That Make Money, and Keep Those That Do Not"

APPA repeats their argument that, since PMAs make money, they therefore should not be sold. It should be stressed again that it often makes sense to sell a revenue producing asset. If you own a revenue generating asset which is worth $100 to you it would be rational for you to sell the asset if somebody offers $200 for it. You do not refuse to sell it on the grounds that it is "making money," when more money can be made from selling it. Such is the case with virtually all transactions in our economy.

On this issue, APPA tends to contradict itself. Among the alleged benefits of public ownership is that rates can be kept low because public industries do not have a profit margin built into the rates. The first question that comes to mind is, if PMAs are not making profits, how are they making money?

What is going on here is a manipulation of terms. The federal government's involvement in PMAs can be thought of as the same as an individual's purchase of a bond. The government expects to get paid back with interest; likewise, the individual expects to get paid back with interest. APPA wants to call the first cost-based pricing and the second a profit margin. However, there is no economic difference between the two. One can either say both have profit margins or that both use cost-based pricing. It is thus incorrect for APPA to claim that public control can keep rates low by doing away with profits.

7) "Sellout Would Create a Procedural Nightmare"

APPA claims that there are insurmountable Constitutional and statutory difficulties in the sale of PMAs. Certainly there are some complications in selling PMAs, but they are hardly insoluble. For example, the current system of preferences could be reflected in the common stock offering with regard to the order of sale and the amount of discount. In fact, such proposals have the merit of putting control of the PMAs in the hands of the users rather than the government.

Any obligations to which PMAs are legally bound will become liabilities of the new owners and will be reflected in the price of the assets. PMA owners and those holding claims against them will have the freedom to resolve any problems as they see fit in a mutually beneficial way.

8) "Productivity, Stability Undermined"

According to APPA, productivity and stability are achieved through federal control. As noted earlier, public industries are almost never more productive than private ones because the profit motive is absent. Typical examples of the "productivity" of public industries are WPPSS and the United States Postal Service. As far as stability is concerned, the only things which will be undermined are years of subsidized rates and the federal shelter from the efficiencies produced by competition.

The argument made by APPA is basically summarized by one quote taken from the APPA position paper: "The electric utility industry best serves the nation if diversity of ownership exists so as to encourage yardstick competition, prevent monopoly, and minimize or eliminate competitive abuses." But what could be more monopolistic than government ownership of all five PMAs? It is difficult to see how taking the PMAs from one owner (the federal government) and selling them off in a common stock offering to several owners will lead to monopoly. If anything, the record shows that government is often the most pervasive source of monopoly. Second, PMAs offer no "yardstick" since their rates are heavily subsidized. Finally, there is nothing more anti-competitive than a decision structure which reacts to special interests instead of market forces. Well-organized pressure groups assert such a structure is in the public interest, but the only interest it really serves is their own.

End Notes

1. Roth, Timothy, "Power Marketing Administrations: The Case for Privatization", CSE Issue Analysis, No. 8, p. 5.

2. Ibid.

3. President's Private Sector Survey on Cost Control: Report on Privatization (PPSSCC), (Washington, D.C.: U.S. Government Printing Office, 1983), pp. 65-66.

4. Ibid., p. 44.

5. Cooper, Peter, "The Bonneville Power Administration: The Worst Mess by a Dam Site," The Cato Institute, February 6, 1986, p. 11.

6. Ibid.

CSE PRIVATIZATION PUBLICATIONS

ISSUE ANALYSES:

Privatizing Washington's Airports by Robert W. Poole, Jr., No. 2, May 28, 1985.

The Grace Commission Report and The Military Commissary System by Steve Pejovich, No. 4, July 8, 1985.

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Power Marketing Administrations: The Case for Privatization by Timothy P. Roth, Ph.D., No. 8, January 31, 1986.

The Grace Commission Report and Veterans Administration Health Care by Kim Carney. Estimated date of release May 1, 1986.

CAPITOL COMMENTS:

It's Miller Time at the OMB by Jeffrey C. Smith, No. 1, September 23, 1985.

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Postal Reform Could Deliver Big Consumer Benefits by Jeffrey C. Smith, No. 9, February 19, 1986.

CONGRESSIONAL TESTIMONY:

Before the House Interior and Insular Affairs Committee, Subcommittee on Water and Power Resources on PMA Privatization by Jeffrey C. Smith, February 20, 1986.

Before the House Appropriations Committee, Subcommittee on Energy and Water Development on PMA Privatization by Jeffrey C. Smith, April 9, 1986.

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About Citizens for a Sound Economy

Citizens for a Sound Economy is a grassroots public interest advocacy group dedicated to returning economic decision making to citizens. With an active membership of 250,000 individuals, CSE promotes policy and educational initiatives in the areas of international trade, privatization of government services, Social Security and tax reform.

CSE seeks to unite consumers and business people behind efforts to increase consumer choice and reduce government interference in people's economic affairs. It is a spokesman before Congress, the media, and the public for those who share its views.

CSE accepts no government funding. It is a nonprofit, tax-exempt organization under Section 501(c)(3) of the Internal Revenue Code.

Note

Nothing written here is to be construed as necessarily reflecting the views of Citizens for a Sound Economy or as an attempt to aid or hinder the passage of any bill before Congress.

CSE NEWS
FROM CITIZENS FOR A SOUND ECONOMY

FOR IMMEDIATE RELEASE

Roger Mahan
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CITIZENS' GROUP URGES PUBLIC SALE OF PMAs

(Washington, DC -- April 9, 1986) Citizens for a Sound Economy, a 250,000-member grassroots citizens group, urged Congress today to privatize the federal power marketing administrations (PMAs) through a public stock offering which the group contends could raise between $62 and $77 billion for the U.S. Treasury.

In testimony before the House Appropriations Committee's subcommittee on Energy and Water Development, CSE project director Jeffrey C. Smith said "there is no economic justification for government remaining in the power generation business." He strongly endorsed the Reagan administration's efforts to sell the PMAs to private sector operators.

However, Smith warned, such a proposal must "take into account at least four important factors: 1) demands of the current customers for subsidized power; 2) the wishes of taxpayers for a reasonable rate of return on their investment in PMA construction and their desire for an end to subsidies at their expense; 3) demands of PMA employees; and, 4) Congress' need to meet Gramm-Rudman deficit reduction targets."

According to Smith, a public stock offering for the PMAs "would meet the concerns of current customers, provide a good

return on the taxpayer's investment, and result in greater deficit reduction than proposed in the current budget"

Smith urged the committee to support a public stock offering in which share prices would be based on the current market value of replacing PMA assets. Moreover, to generate support for the proposal, Smith urged that preferences for purchase of the initial stock offering be given to current residential and business customers of the PMAs. "This would involve selling stock to them at below market rates and allowing them the first chance at all stock," Smith said. "This serves several purposes," Smith continued. "First, by giving current customers a stake in the efficient operation of PMAs, it builds a coalition in support of privatization. Second, it puts the current customers in control of their own destiny; they can choose high electric rates and therefore high dividends from the stock or low rates and low dividends."

Smith concluded that this method of privatization is similar to that used in Britain in the sale of British Telecom, Britoil, and Cable and Wireless. More than 2.3 million individuals bought stock in British Telecom upon privatization, Smith noted. Moreover, upon privatization, Smith said, 92 percent of the employees of Britoil and 99 percent of the employees of Cable and Wireless purchased shares in their companies.

Mr. BEVILL. Thank you for a very fine statement.

Next, the Chair will recognize Congressman D'Amours, our former colleague. And we are glad to have you with us.

If you will just be seated there, I will go vote. And as soon as Congressman Myers gets back, the hearing will be continued. It is certainly good to see you again.

Mr. D'AMOURS. It is good to see you again, Mr. Chairman.

WEDNESDAY, APRIL 9, 1986.

BUY AMERICAN PROVISION

WITNESS

HON. NORM D'AMOURS, FORMER REPRESENTATIVE IN CONGRESS FROM THE STATE OF NEW HAMPSHIRE

Mr. MYERS [presiding]. Welcome back, Norm.

Mr. D'AMOURS. Thank you, Mr. Ranking Minority Member.

Mr. MYERS. Sorry about that. You know what happens in these situations.

Mr. D'AMOURS. Chairman Bevill has already acknowledged my presence, and we are ready for you to go.

Mr. MYERS. The committee will come to order and resume.

We are pleased to have our former colleague, Mr. D'Amours. Thank you for coming back. Welcome back. As a witness, too.

Mr. D'AMOURS. It is good to be here in this capacity.

I am particularly happy, Mr. Chairman, to be here representing Brown Boveri, Inc. I was supposed to be accompanied—you will note from my testimony that the name of Don Breder appears. He is the President of Sales, Marketing and Service Group of BBC Brown Boveri, Inc. He was coming in by train. Apparently, there has been a derailment somewhere by Baltimore, so he won't be able to make it in on time.

Mr. MYERS. That formed steel buckled.

Mr. D'AMOURS. I would rather not touch that one, Mr. Ranking Minority Member.

We are here, obviously, as you know, to discuss Brown Boveri's concerns about Section 506 of Public Law 99-141 of last year's Energy and Water appropriations bill. We find that while we can understand the motivation for such a provision, and while we abhor unfair trade practices wherever they occur, we believe that this is a particularly heavy-handed form of protectionism which ought to be resisted.

We are particularly concerned that if this 25 percent "Buy America" preference is applied indiscriminately for extra high voltage power equipment towards all offshore suppliers regardless of the country of origin, then it becomes a particularly unfair and even counterproductive instrument with respect to those countries which have made great strides to comply with free trade principles and fair trade principles.

It is important to note, Mr. Chairman, and Ranking Minority Member of the subcommittee, free and fair trade practices are a major catalyst for technological advancement. It is fair competition

that manufacturers in a free trade environment use to obtain both the inspiration and motivation to develop advanced technologies, and such developments are designed to offer more economic solutions. And the ultimate beneficiaries are the users.

It is our belief that the losses of market shares by some U.S. manufacturers in the extra high voltage industry has not so much to do with prices but, rather, in many cases, with technological insufficiency. And not only does protectionism tend to inhibit technological innovation and advancement, but it has a pernicious effect upon consumers in the protected market by raising their prices and their costs.

There is the question of fairness, which I referred to earlier, Mr. Chairman, and Ranking Minority Member, and on this question consider that Switzerland is a major producer of extra high voltage power equipment. It allows foreign and Swiss manufacturers of electrical machinery to compete equally for Swiss contracts and markets. Bilateral exchange of electrical machinery and equipment between the U.S. and Switzerland are nearly in balance, meaning that on a per capita basis Switzerland imports much more electrical equipment from the U.S. than the U.S. imports from Switzerland.

We have a very favorable balance of trade on a real and per capita basis with that country. In my testimony, there are some figures which document that process from 1981 through 1984, which will show rather dramatically that Switzerland is not protecting its markets from the United States' technology in this area, and, may I say, in many other areas, or in any other areas. Switzerland is a very fair trade-minded country.

Beyond this, during the GATT talks in Tokyo, the recently completed round, and in 1979 and 1980 Switzerland sided with the United States, and not with the EEC, in strongly supporting the inclusion of the energy sector in GATT's procurement code.

Now, Brown Boveri, Inc. is a subsidiary of Brown Boveri Company of Switzerland. Brown Boveri, Inc. has been marketing its technologies in the United States since the early Twenties. In 1946, they organized as a U.S. corporation. They are a domestic American corporation.

Today, Brown Boveri employs about 2,300 American workers at 66 locations in 25 States throughout the country. And as you know, John, they have plants in Pennsylvania.

Furthermore, Brown Boveri and Company distribute to our balance of payments specifically between the U.S. and Switzerland because Brown Boveri has purchased approximately $150 million of equipment ranging from computers to capacitors from a great number of U.S. companies in 1984.

I am approaching the end of my testimony. I want to limit this as best I can. But it should be stressed that Brown Boveri can demonstrate a U.S. concept in excess of 50 percent in its production of high voltage circuit breakers of 115 kilovolts and above, including extra high voltage breakers. I think that is important.

It is important because some well-known U.S. manufacturers use large percentages of foreign-manufactured products in their extra high voltage equipment. Now, because of that, there are at least two major Japanese companies—Mitsubishi and Hitachi—that will

benefit from the Buy America provisions included last year in the appropriations to which I direct my testimony.

I know that was not intended by this committee, but because of the realities that I have just outlined that becomes the fact.

I would say, therefore, Mr. Chairman, and Mr. Ranking Minority Member, that whatever is done certainly somebody has to pay a great deal of attention at the very least, including some provisions in this year's appropriations bill, if it is going to include a Section 506, include provisions that would treat nations such as Switzerland that are free trade and fair trading nations to some consideration, some special consideration; otherwise, we will be indiscriminately punishing free trade countries while ostensibly seeking to provide legislation that encourages countries to rise to a free trade international posture and support America's GATT and other efforts to do so.

I don't think this committee wants that to happen. I would hope that when the markup time comes and as this moves along, Mr. Ranking Minority Member, that you and the Chairman and other members of this subcommittee will heed this problem, which is a very serious problem. We don't want to be counterproductive while we espouse free trade philosophy.

That is all I have by way of an oral presentation. I summarized my statement. It is a little longer. I didn't look at the time. I hope I stayed within five minutes.

[The statement of Mr. D'Amours follows:]

Statement of BBC Brown Boveri, Inc.

Before House Appropriations

Subcommittee on Energy and Water Development

on

Section 506 of Public Law 99-141

April 9, 1986

Chairman Bevill and distinguished Members of the Committee, I am Norman D'Amours, and with me is Donald Breder, President, Sales, Marketing and Service Group, BBC Brown Boveri, Inc., of White Plains, New York. We are here to discuss Brown Boveri's concerns about Section 506 of Public Law 99-141, Energy and Water Appropriations for Fiscal Year 1986, containing an increase in the "Buy American" differential from 6% to 25% for the procurement of extra high voltage (EHV) power equipment by the Power Marketing Administrations and the Tennessee Valley Authority.

If the 25% "Buy American" differential is applied indiscriminately for EHV power equipment toward all offshore suppliers, irrespective of the country of origin, it becomes a very unfair and counterproductive instrument with respect to those countries which have made great strides to comply with the principle of free and fair trade. Free and fair trade practices are a catalyst for technological advancements. It is through fair competition that the manufacturers in a free trade environment obtain both inspiration and motivation to develop advanced technologies. Since such developments are designed to offer more economical solutions, the ultimate beneficiaries will be the users.

The extra high voltage equipment industry include a number of high technology components and systems that require heavy research and development with a long term commitment to remaining technologically competitive worldwide. It is our belief that the loss of market shares by some U.S. manufacturers in the extra high voltage industry has not so much to do with prices, but rather with technological insufficiency.

Not only does protectionism tend to inhibit technological innovation and advancement but it also has a pernicious effect upon consumers in the protected market. Representative Sam Gibbons, Chairman of the Subcommittee on Trade, Committee on Ways and Means, stated on September 18, 1985, "As you know, the effect of the prohibition would be to guarantee the one domestic producer of direct current EHV power equipment sole access to the federally-funded procurement market. Creating a legal monopoly for such equipment and denying access to foreign advanced technology is likely to result in higher electricity costs for industrial users and individual consumers."

The Tennessee Valley Authority has said that, "Without competition from foreign suppliers, the costs to TVA of EHV equipment from these exclusive suppliers could be expected to rise sharply and the equipment delivery time to be longer."

On the question of fairness, consider that Switzerland, a major producer of EHV power equipment, allows foreign and Swiss manufacturers of electrical machinery to compete equally for Swiss contracts. Bilateral exchange of electrical machinery and equipment between the U.S. and Switzerland is nearly in balance; meaning that on a per capita basis, Switzerland imports more electrical equipment from the U.S. than the U.S. imports from Switzerland.

The following are recent trade figures between the U.S. and Switzerland in millions of dollars:

	1981	1982	1983	1984
U.S. Exports	3,022	2,707	2,960	2,563
U.S. Imports	2,448	2,340	2,494	3,199
U.S. Balance of Trade	547	367	466	-636*
U.S. Share of Market	7.4	7.2	8.4	6.0

*U.S. trade deficits in 1984 were due to the strong dollar.

During the General Agreement on Tariffs and Trade (GATT) Tokyo Round completed in 1979/1980, Switzerland sided with the U.S. and not the European Economic Community (EEC) and strongly supported the inclusion of the energy sector in GATT's procurement code. A new round of GATT trade negotiations, whose aim is to strengthen and expand the open multilateral trading system, is currently in the preparatory stage. Switzerland, like the U.S., supports the idea of including services, high technology products, and software in the procurement code.

BBC Brown Boveri, Inc., a subsidiary of Brown, Boveri & Company of Switzerland, began marketing its technologies in the U.S. as early as the 1920s, and in 1946 organized as a U.S. corporation. Today, Brown Boveri employs a work force of 2,300 at 66 locations in 25 states throughout the U.S. Furthermore, Brown, Boveri & Company, contributing to the balance of trade between the U.S. and Switzerland, purchased approximately $150 million of equipment, ranging from computers to capacitors, from a great number of U.S. companies in 1984.

Most importantly, Brown Boveri can demonstrate a U.S. content in excess of 50% in its production of high voltage circuit breakers of 115 KV and above, including extra high voltage breakers. Unfortunately, some well-known U.S. manufacturers use large percentages of foreign-manufactured products in their EHV equipment. Because of this reality, two Japanese companies, Mitsubishi and Hitachi, will benefit from the "Buy America" provisions which your Committee included in the appropriations bill last year. As you know, of course, Japan's own market for such equipment is basically closed to U.S. producers.

We are sure the Subcommittee did not mean to favor Japanese-made products over Swiss-made products in its "Buy American" provision of last year, however, this is the result.

We therefore respectfully request that this "Buy America" provision be repealed or at the very least that some provisions be included to grant companies of free and fair trading nations the ability to continue to market their products in the United States to TVA and the Federal Power Marketing Administrations on a fair, competitive basis.

Mr. MYERS. Close enough for government work.

Mr. D'AMOURS. If I didn't, thanks for your forbearance, John.

In any event, that is all I have. If you have questions, written or oral, I will try to respond.

Mr. MYERS. Thank you, Norm, for your fine presentation. You are, having been a former Member, aware of the sensitive political issue that Congress faces, not only this committee but across the spectrum, of purchasing by government agencies and those that we appropriate for. It is a sensitive political issue, and we have people unemployed here and we have the imbalance of trade today.

But the one thing that disturbs me is that, yes, Switzerland does allow free trade, and we appreciate that; but, there are countries that want to sell to us but they don't allow us to sell to them. Maybe we need to address that problem, too.

Mr. D'AMOURS. Exactly.

Mr. MYERS. I think the American industry can compete with any other industry in the world. And, as you say, technology is crossing boundaries, political boundaries, of course. And it is a very tough problem we will be facing.

We have questions here. Mr. Conte, who is the Ranking Member on the full Appropriations Committee, has some questions, and he is particularly concerned about this issue, and we will provide those for you to respond to for the record.

Mr. D'AMOURS. A written response to those, yes, okay.

Does the committee have a time frame?

Mr. MYERS. Five days, Norm, if you can.

Mr. D'AMOURS. We will try to get answers produced within five days or something reasonably close to that time frame.

Mr. MYERS. We will have them for you today.

[The questions follow:]

Questioning by the Honorable Silvio O. Conte of Mr. Don Breder and Hon. Norm D'Amours, representing Brown Boveri & Co. Ltd.

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1. What products does Brown Boveri manufacture that are affected by the Buy American differential, and where are they manufactured?

2. What is the nature of the relationship between your parent company and your U.S. entity in terms of financing, marketing, and other similar support?

3. To what degree are Switzerland's utilities open to U.S. manufacturers of extra-high voltage and other electrical equipment?

4. How much EHV equipment has been purchased by Swiss utilities, either private or public, from U.S. manufacturers over the past ten years? How much from other manufacturers?

5. Where are Brown-Boveri's manufacturing plants located? Isn't most manufacturing done in West Germany, not Switzerland?

6. To what degree are West Germany's utilities open to U.S. manufacturers of extra-high voltage and other electrical equipment?

7. How much EHV equipment has been purchased by German utilities from U.S. manufacturers over the past ten years? How much from other manufacturers?

8. Brown-Boveri is listed as a member of the International Electrical Association (IEA), a cartel whose principal goal has been to set market prices and terms and share market information among members. While the IEA's actions have been focused outside of the U.S. market, in 1984 the cartel approved the so-called "Y" Agreement, which extended IEA efforts to the U.S. market. Would you comment on IEA activities associated with the U.S. market under the "Y" Agreement, and outline your company's and your parent company's participation in those activities?

9. Are there any export credit subsidies passed on to your U.S. entity from your parent company?

ALCALDE, HENDERSON, O'BANNON & ROUSSELOT

GOVERNMENT & PUBLIC AFFAIRS CONSULTANTS

April 15, 1986

Mr. Tom Bevill
Chairman
House Sub-committee on Energy
and Water Development
2362 Rayburn House Office Bldg.
Washington, D.C. 20515

Attn: Hunter Spillan

Dear Mr. Chairman:

Enclosed are the answers of BBC Brown Boveri, Inc. to written questions submitted by Congressmen Conte and Rudd during Brown Boveri's testimony on April 9th, 1986.

Sincerely,

Norman E. D'Amours

NEA:hd

Encs.

1901 N. FT. MYER DRIVE TWELFTH FLOOR ROSSLYN, VIRGINIA 22209 PH. 703 841-0626

To: House Sub-committee on Energy and Water

Re: BBC Brown Boveri Inc.'s Answers to the Questions raised by the Honorable Silvio O. Conte during testimony before the Sub-committee on April 9th, 1986

Answer to Question 1:

Brown Boveri and its subsidiaries manufacture extra high voltage power equipment in the U.S., Switzerland, West Germany, Norway, and Italy, specifically, circuit breakers rated 345 kV and above, relays, transformers rated above 10,000 kVA, AC/DC valves and controls, high voltage DC systems, surge arrestors, fuses rated 2300 V and above, capacitors and tapered tubular steel structures, or structural units to support overhead electrical transmission lines.

Answer to Question 2:

BBC Brown Boveri, Inc. (the U.S. company) enjoys full regional autonomy in terms of marketing for the U.S. market. For exports of the products it manufactures in the U.S., it uses the sales offices of the Brown Boveri companies in other countries of the world. All transactions are strictly at arm's length. Beyond that, BBC Brown Boveri, Inc. is a wholly owned subsidiary of BBC Brown Boveri & Company Ltd. of Switzerland and is technically and financially supported by its parent company.

Answers to Questions 3 and 4:

The Swiss utilities, either private or public are open to all manufacturers, including U.S. manufacturers, for any type of electrical equipment. There are no restrictions, neither by law nor by practice, which would prevent foreign vendors, including U.S. manufacturers, from competing for electrical equipment. In fact, the Swiss market for EHV power equipment is very small. The highest voltage in Switzerland (used for a few power lines over very short distances only) is 420 kV. For instance, during the six-year period 1980 - 1985, only one order was placed for the extension of a gas insulated substation which was rated at 380 kV. High voltage breakers of 345 kV or above have been ordered traditionally at a rate of 1 to 2 breakers per year, typically for extensions of existing stations.

U.S. manufacturers have not chosen to participate in this small market sector because of the cost benefit ratio imposed by this reality.

In markets for other products showing an attractive volume where U.S. manufacturers have chosen to pursue business, they have been very successful, e.g.

Computers
Medical apparatus
Electronics
Nuclear reactors (from General Electric and Westinghouse)
Aircrafts
Automobiles
Defense equipment
Etc.

Answer to Question 5:

Brown Boveri maintains manufacturing plants in a great number of countries with large units in Switzerland and West Germany. The majority of EHV power equipment is manufactured in Switzerland or in the U.S. Today, Brown Boveri has a work force of 2300 employees at 66 locations in 25 States throughout the U.S., with manufacturing plants in 11 locations.

Answers to Questions 6 and 7:

West Germany's utilities are open to U.S. manufacturers for extra high voltage and other electrical equipment.

Trade Figures between the U.S. and West Germany

In Millions of $ for Electrical Equipment:

	1981	1982	1983	1984	1985 First Half
U.S. Exports	2,770	2,692	2,759	3,096	1,656
U.S. Imports	1,040	1,115	1,308	1,656	837
U.S. Balance of Trade	1,730	1,577	1,451	1,440	819

Answer to Question 8:

BBC Brown Boveri, Inc. lives here in a typically competitive environment, does not want and does not expect to be awarded a contract except on the merit of the applicable proposal and on the merit of its record. When it comes to equipment the greater part of which has been manufactured by any of our European affiliates, BBC Brown Boveri, Inc. is a buyer and reseller of that equipment at fair and competitive prices. As a U.S. corporation, our relationship with our European parent and affiliates is strictly at arm's length. Neither we, nor our parent, in any single instance, were ever involved in any price or other col-

lusion with any of our competitors involving equipment bought by any of our U.S. customers.

Answer to Question 9:

No. None whatsoever.

To: House Sub-committee on Energy and Water

Re: BBC Brown Boveri Inc.'s Answers to the Questions raised by the Honorable Eldon Rudd during testimony before the Sub-committee on April 9th, 1986

Answer to Question 1:

Brown Boveri maintains a circuit breaker plant in Greensburg, Pennsylvania, where circuit breakers for high and extra high voltages are manufactured and assembled. The U.S. domestic content of this equipment for both live tank and dead tank breakers amounts to approximately 75% since, with the exception of a few components imported from Switzerland and West Germany, all items are either manufactured in Greensburg, other Brown Boveri plants in the U.S., or sourced locally from third party suppliers in the U.S.

Answer to Question 2:

It is true that both foreign and Swiss manufacturers of electrical machinery are able to compete equally for Swiss contracts. U.S. companies which have chosen to actively pursue the business segment in which they are interested have been successful in capturing substantial market shares.

We have been informed that the Japanese market for high voltage equipment is basically closed to U.S. producers, and, for that matter, to other foreign suppliers. However, Japanese manufacturers benefit from the "Buy American" provision, as both Hitachi and Mitsubishi maintain close relationships with General Electric and Westinghouse, respectively. Westinghouse acts as a distributor through "WM" in Pittsburgh of Mitsubishi breakers of 115 kV and above, as well as of gas insulated substations for voltages in excess of 115 kV. Likewise, General Electric, through High Voltage Breaker, Inc. of Atlanta, a company jointly owned by General Electric and Hitachi, acts as a distributor of imported Hitachi breakers and gas insulated substations rated at 115 kV and above.

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April 15, 1986

Honorable Tom Bevill
Chairman,
Subcommittee on Energy & Water Development
Committee on Appropriations
Rayburn House Office Building
Room 2362
Washington, D. C. 20515

Dear Chairman Bevill:

I am writing on behalf of BBC Brown Boveri, Inc. (Brown Boveri) for the purpose of clarifying a comment in one of the statements submitted to the Subcommittee on Energy and Water Development at the hearing on April 9th relating to a proposed amendment of the Buy American Act. The views of Brown Boveri were presented by Mr. Norman D'Amours at the hearing. A statement was also submitted by ASEA, Inc. and it is this statement which contains the comment to which we refer. ASEA made reference to an antidumping investigation of large power transformers and implied that as a result of this proceeding "penalties" were imposed upon all the companies reviewed during the investigation with the exception of ASEA. As counsel for Brown Boveri in connection with that investigation I can state that this is incorrect.

Although there was a finding by the Treasury Department of dumping with respect to large power transformers from Switzerland, as well as from several other countries, Brown Boveri, who was the only importer of such transformers from Switzerland, was never assessed with antidumping duties nor with penalties. It should be noted that antidumping investigations do not result in the imposition of penalties as referred to in ASEA's statement but rather in the imposition of antidumping duties which are assessed when there has been a finding of "sales at less than fair value" in respect to specific importations. Following the initial determination the Treasury Department examined each individual importation of large power transformers from Switzerland and found that there were no

"sales at less than fair value." As a consequence, antidumping duties were never assessed against Brown Boveri and the Treasury Department revoked the finding of dumping in respect to Switzerland on July 26, 1978. (41 Fed. Reg. 29435, July 16, 1976; and 43 Fed. Reg. 32293, July 26, 1978).

For the purpose of accuracy we ask that this letter be accepted as part of the record.

Respectfully submitted,

E. Thomas Honey

ETH/mg

Mr. D'AMOURS. Thank you, Mr. Ranking Minority Member. Sorry about the vote.

Mr. MYERS. Good to see you, Norm.

WEDNESDAY, APRIL 9, 1986.

BUY AMERICAN PROVISION

WITNESS

JOHN J. O'HARA, PRESIDENT, ASEA, INC.

Mr. MYERS. Next, John O'Hara, on the Buy American Provision.

Mr. O'HARA. I hope I am not the only one standing between you and lunch now.

Mr. MYERS. I don't eat lunch, so I don't mind. The staff is looking daggers.

You may proceed as you wish.

Mr. O'HARA. Thank you.

My thoughts follow very much along the same line; I am addressing this Buy American provision that has just been discussed. I am going to try to discuss it from a sense of fair play and what I think some of the objectives should be that you outlined in trying to achieve this.

Like you, who have found your satisfaction in the political arena, I have been an engineer for my career of 35 years, and almost all of it has been associated with this very arena of high voltage equipment. So, I speak with some feeling.

I am the President of ASEA, Inc., the principal U.S. operating company of ASEA AB, a multinational company, headquartered in Sweden. And, like Brown Boveri, we have 2,200 employees in the United States and 11 operations. I am here to discuss the Buy American restriction that requires a 25 percent evaluation penalty to be added to nondomestic extra high voltage equipment and the negative impact this has on those countries with open markets where U.S. manufacturers are free to compete for similar equipment without restraint.

Talking with you and others, two of the major objectives you had in this Buy American restriction was to encourage those countries whose markets for extra high voltage equipment are closed to open these markets to U.S. manufacturers, and to ensure fair competition in these products. ASEA strongly supports these efforts because ASEA and Sweden suffer from the same unfair trade practices of closed market countries that U.S.-based companies, such as General Electric and Westinghouse, face.

However, last year's Buy American provision did not distinguish between countries that open their markets to U.S. manufacturers and those that do not. Therefore, if it continues to be advisable for the United States to include the 25 percent evaluation penalty, we believe there should be some recognition on those restrictions of imports from open market countries such as Sweden.

I have suggested that Sweden should be exempted from these restrictions, and I would like to give you the reasons why. The first is

that Sweden's market for extra high voltage equipment is open to U.S. exports. In the last eight years, there is a trade surplus with Sweden in electrical equipment favoring U.S. manufacturers of almost one-half billion dollars. This figure is based on data from the Commerce Department, SITC Codes 71 and 77 for power generating machinery and electrical apparatus.

The Swedish State Power Board, which is the Swedish equivalent of the power marketing administrations, BPA and TVA, purchases 20 to 30 percent of its equipment from foreign manufacturers, including U.S. manufacturers. Also, Sweden's tariffs on this equipment are comparable to those of the United States, and there are no economic evaluation penalties comparable to those of the Buy American provisions that are enforced on non-domestic manufacturers.

Second, ASEA is a fair competitor in the United States. ASEA is an investor-owned company that receives no subsidies for R&D or export activities. Moreover, ASEA has not sold products at less than fair market value.

I think you are familiar with the transformer dumping situation and the recent GAO report that talks about power transformers from Italy, France, United Kingdom and Switzerland, all having been found guilty of dumping.

ASEA was reviewed at the same time, and ASEA was dismissed without imposition of penalties.

Finally, Sweden has long supported the addition of heavy electrical equipment to the GATT Government Procurement Code. This support has been recognized by the Departments of State and Commerce in submissions included in a 1984 GAO report. To further clarify that position, we have enclosed a copy of a statement by the Swedish Foreign Office submitted to the GATT outlining Sweden's formal endorsement of adding heavy electrical equipment to the GATT Code. A copy is attached to my testimony.

In conclusion, I support the effort to encourage countries to open their markets, but I believe that application of the 25 percent "Buy American" differential to Sweden is unfair to ASEA and inconsistent with the original objectives of the "Buy American" provision in Public Law Number 99-141, as well as U.S. trade policy.

The U.S. Government has been encouraging other countries to open their markets to fair competition. When the U.S. Government closes its electrical power equipment market to exports from open market countries such as Sweden, it is engaging in the same unfair trade practices with which it has charged other countries.

Therefore, I can only urge if the 25 percent Buy American restriction is retained, that consideration be given to an exception for those open market countries that are prepared to buy the same equipment from the United States.

I would welcome any thoughts or questions that you may have.

[The statement of Mr. O'Hara follows:]

April 9, 1986

Testimony of John O'Hara

o I am the President and Chief Executive Officer of ASEA, Inc., the principal U.S. operating company of ASEA AB, a multinational manufacturing firm headquartered in Sweden, with 2,200 employees and 11 operating units here in the U.S.

o I am here to discuss the Buy American restriction that requires a 25-percent evaluation penalty be added to non-domestic EHV equipment -- and the negative impact this has on those countries with open markets where U.S. manufacturers are free to compete for similar equipment without restraint.

o One of the major objectives of this Buy American restriction was to encourage those countries whose markets for extra high voltage equipment are closed to open these markets to U.S. manufacturers -- and to ensure fair competition in those products.

o ASEA strongly supports this U.S. effort to open utility markets for EHV equipment. ASEA and Sweden suffer from the same unfair trade practices of closed market countries that affect U.S.- based companies such as Westinghouse and General Electric.

o Last year's provision, however, does not distinguish between countries that open their markets to U.S. manufacturers and those that do not.

o Therefore, if it continues to be advisable for the United States to include the 25-percent evaluation penalty, we believe there should be an exception to the restriction for imports from open market countries, such as Sweden.

o I have suggested that Sweden should be exempted from these restrictions and I would like to give you the reasons why:

-- First, Sweden's market for EHV equipment is open to U.S. exports. In the last eight years, there is a trade surplus with Sweden in electrical equipment favoring U.S. manufacturers of almost one-half billion dollars. (This figure is based on data from the Commerce Department, SITC Codes 71 and 77 for power generating machinery and electrical apparatus.) The Swedish State Power Board, which is the Swedish equivalent of the power marketing administrations and TVA, purchases 20 to 30 percent of its equipment from foreign manufacturers, including U.S. manufacturers. We have identified specific instances in which the State Power Board made purchases

from a U.S. manufacturer in competition with ASEA. Also, Sweden's tariffs on this equipment are comparable to those of the United States and there are no economic evaluation penalties comparable to those of the Buy American provisions that are enforced on non-domestic manufacturers.

-- Second, ASEA is a fair competitor in the United States. ASEA is an investor-owned company that receives no subsidies for R&D or export activities. Moreover, ASEA has not sold products at less than fair market value. For example, according to a recent report by GAO, transformer manufacturers from France, Italy, Japan, the United Kingdom, and Switzerland have all been found guilty of dumping. However, ASEA's practices were reviewed during the same investigation, and ASEA was dismissed without the imposition of penalties.

-- Finally, Sweden has long supported the addition of heavy electrical equipment to the GATT Government Procurement Code. This support has been recognized by the Departments of State and Commerce in submissions included in a 1984 GAO report. To further clarify that position, we have enclosed a copy of a statement by the Swedish Foreign Office submitted to the GATT outlining Sweden's formal endorsement of adding heavy electrical

equipment to the GATT Code. (A copy is attached to my testimony.)

o In conclusion, although I support the effort to encourage countries to open their markets, I believe that application of the 25-percent "Buy American" differential to Sweden is unfair to ASEA and inconsistent with the original objectives of the "Buy American" provision in Public Law No. 99-141 as well as U.S. trade policy. The U.S. Government has been encouraging other countries to open their markets to fair competition. When the U.S. Government closes its electrical power equipment market to exports from open market countries such as Sweden, it is engaging in the same unfair trade practices with which it has charged other countries.

Therefore, if the 25-percent "Buy American" restriction is retained, it should contain an exception for open market countries such as Sweden.

STATEMENT OF JOHN O'HARA, PRESIDENT OF ASEA INC., BEFORE THE SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT OF THE COMMITTEE ON APPROPRIATIONS OF THE HOUSE OF REPRESENTATIVES

SUMMARY

Last year, Congress included a "Buy American" provision in Public Law No. 99-141, the Energy and Water Development Appropriations Act for fiscal 1986, which requires the Tennessee Valley Authority and the federal power marketing administrations to purchase U.S.-origin extra high voltage equipment at prices that are as much as 25 percent above competitive levels. The purpose of this restriction is to encourage countries that close their markets to U.S. exports of extra-high voltage equipment to change their policies and support free trade.

ASEA Inc., which sells and manufactures EHV equipment in the United States, and ASEA AB, its Swedish parent company, strongly support the U.S. effort to open closed foreign markets. Sweden, as well as the United States, suffers from the unfair trade practices of certain countries. Last year's "Buy American" provision, however, is overbroad and encompasses imports from Sweden, a country with a clear record of free and fair trade in heavy electrical equipment. Therefore, if the restriction is continued this year, we believe there should be an exception for exports from open market countries such as Sweden.

* * *

INTRODUCTION

My name is John O'Hara. I am the President and Chief Executive Officer of ASEA Inc., the principal U.S. operating company of ASEA AB, a multinational manufacturing firm headquartered in Sweden. I am submitting this statement on behalf of ASEA Inc.

At present, ASEA group activities in the United States consist of 11 operating units employing more than 2,200 men and women at some 39 locations throughout the country. Our parent, ASEA AB, was founded in 1883; it today ranks as one of the world's ten largest electrical and electronics companies. ASEA is a leading supplier of equipment for hydro, nuclear, and high voltage electrical equipment. ASEA is also a technological leader in high voltage direct current ("HVDC") transmission and reactive power compensation.

We are here to discuss the Buy American restriction Congress included last year in Pub. L. No. 99-141, the Energy and Water Development Appropriations Act for fiscal 1986. The provision requires the Tennessee Valley Authority and the federal power marketing administrations ("PMAs") to purchase

U.S.-origin extra high voltage ("EHV") equipment at prices that are as much as 25 percent above competitive levels. According to last year's House Committee Report, the restriction was imposed because U.S. manufacturers of EHV equipment are being injured by foreign manufacturers that (a) operate in home markets closed to U.S. competition (b) are subsidized by their governments, and (c) dump their products at less than fair value in the United States.

We agree that there is a need for legislation that responds to the unfair trade practices of foreign countries who follow such practices. ASEA faces these same unfair trade practices when it tries to sell in those countries. However, we do want to highlight the unfairness of a Buy American provision which does not distinguish between countries that open their markets to U.S. manufacturers and those that do not.

I. THE JUSTIFICATIONS FOR THE BUY AMERICAN RESTRICTION DO NOT APPLY TO ASEA AB OR SWEDEN

Sweden's market for EHV equipment is open to U.S. exports. Sweden has a proven record of providing unrestricted market access to foreign suppliers of heavy electrical equipment. Since 1978 (the first year for which statistics are available) the U.S. has a total surplus of $497 million in trade with Sweden in power generating and electrical machinery as shown by the following:[1]

In Millions of U.S. Dollars

	1978	1979	1980	1981	1982	1983	1984	1985
U.S. exports	126	196	205	193	192	193	242	238
U.S. imports	72	84	96	110	99	139	173	315
U.S. surplus	54	112	109	83	93	54	69	-77[2]

Moreover, Sweden, unlike the United States, has no laws which require government entities to prefer Swedish manufacturers. In fact, Swedish law prohibits application of evaluation penalties such as those included in the Buy American provisions. The Swedish State Power Board (the Swedish equivalent of the federal power agencies) is required to base purchase decisions only upon commercial considerations, without preference for products manufactured in Sweden. In addition,

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[1] Source: U.S. Department of Commerce Annual Export/Import Statistics. These statistics are for SITC codes 71 (power generating machinery) and 77 (electrical machinery and electrical apparatus).

[2] The 1985 deficit is due largely to the significant increase in the value of the dollar in early 1985. However, since then the value of the dollar in relation to the Swedish Kroner has declined 20 percent, making U.S. products much more competitive.

Sweden's import duties on EHV equipment are approximately the same as those of the United States.

U.S. manufacturers have the full opportunity to compete under the Swedish government's open procurement policies. Recent major purchases of U.S. equipment by the Swedish State Power Board (made even though ASEA was a competitor) include:

- EHV power circuit breakers
- EHV generator step-up power transformers
- three nuclear reactors

In recent years, the Swedish State Power Board has made between 20 and 30 percent of its purchases from foreign suppliers.

Finally, Sweden is a signatory to the GATT Government Procurement Code, and has supported efforts to add EHV equipment to the Code. Attached is a recent statement by the Swedish Ministry for Foreign Affairs confirming that country's endorsement of expansion of the Code. Sweden's long-standing support for broadened coverage of the Code has been acknowledged by the U.S. Departments of State and Commerce.[3]

ASEA is a fair competitor in the United States. ASEA AB is an investor-owned company that finances its own research and development. It receives no gover ment subsidies and no tax rebates or subsidies for exports to the United States.

In addition, ASEA's products are sold in the United States at fair prices. Transformer manufacturers from France, Italy, Japan, Switzerland, and the United Kingdom all have been found guilty of dumping.[4] ASEA was the only company reviewed during that investigation which was dismissed from the proceeding without any penalties imposed.[5]

ASEA has brought significant benefits to the U.S. economy. It has transferred important technology to the United States. For example:

- ASEA introduced HVDC technology to the United States, licensed that technology to General Electric, and built the first U.S. HVDC project in a joint venture with General Electric in 1964.

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[3] General Accounting Office, "The International Agreement on Government Procurement: An Assessment of its Commerical Value and U.S. Government Implementation," (July 16, 1984) at 58, 68.

[4] See 37 Fed. Reg. 8136 (April 23, 1972).

[5] See 37 Fed. Reg. 961 (Jan. 21, 1972).

- ASEA jointly financed and built (with American Electric Power Co.) an ultra high voltage demonstration project in Indiana.

- ASEA introduced advanced arrestor technology to the United States by licensing Ohio Brass to manufacture arrestor products in the United States.

- ASEA has built a Power Systems Center in New Berlin, Wisconsin with one of the most sophisticated transmission system simulators in the United States, which is used, in part, to perform development activities for U.S. utilities.

II. ASEA's CONCERNS ABOUT "BUY AMERICAN" RESTRICTIONS

The Buy American restriction will limit the growth of ASEA's U.S. operations. ASEA's U.S. operations have been expanding steadily over the past few years, and continued rapid growth is projected. For example, present plans for ASEA Electric (an ASEA Inc. subsidiary) call for an additional 400 employees in the Milwaukee area. Unwarranted restrictions on imports of Swedish equipment and technology, however, would severely impede this growth for the following reasons:

- ASEA AB transfers manufacturing operations to the United States when demand for ASEA's products warrants the capital investment. For example, sales of ASEA's Swedish-made circuit breakers in the United States have now expanded to the point where we can increase the U.S.-manufactured portion of the circuit breakers that we build in Wisconsin. This plan is now underway.

- Sales of transmission projects by ASEA Power Systems translate into sales of components by ASEA Electric. When ASEA Power Systems (an ASEA Inc. subsidiary) receives a contract to construct a major transmission system, it must supply a wide variety of components. Some of these components are imported from Sweden, but an important part will be purchased from ASEA Electric as well as from other U.S. manufacturers.

Thus, rather than protecting U.S. jobs, the "Buy American" restriction may end up preventing ASEA from expanding its U.S. operations to offer new employment opportunities for U.S. workers and produce new products not currently manufactured in the United States.

The Buy American restriction will reduce competition in the United States and penalize the wrong country. The 25 percent Buy American subsidy ignores the benefits of competition to the federal agencies that procure EHV equipment. Participation by fair competitors, such as ASEA, stimulates

healthy competition over price and promotes technical innovation. For example, General Electric is the only U.S. competitor in HVDC transmission. The 25 percent Buy American differential gives General Electric a monopoly over federal procurement of HVDC equipment and ultimately will lead to higher prices and inferior quality. In contrast, an open market exception would provide for competitive bidding in EHV procurement and help keep prices at a reasonable level. Moreover, by stopping imports from Sweden, which has been an open market for this equipment, the United States would be sending out the wrong signal to its trading partners and risking the elimination of incentives for others to open up their home market to U.S. manufacturers.

* * *

In conclusion, although I support the effort to encourage countries to open their markets, I believe that application of the 25 percent "Buy American" differential to Sweden is unfair to ASEA and inconsistent with the original objectives of the "Buy American" provision in Public Law No. 99-141 as well as U.S. trade policy. The U.S. Government has been encouraging other countries to open their markets to fair competition. When the U.S. Government closes its electrical power equipment market to exports from open market countries such as Sweden, it is engaging in the same unfair trade practices with which it has charged other countries. In addition, this Buy American restriction may reduce the growth of an important new U.S. manufacturer -- ASEA, Inc.

Therefore, if the 25 percent "Buy American" restriction is retained, it should contain an exception for open market countries such as Sweden.

MINISTRY
FOR
FOREIGN AFFAIRS

The Government Procurement Code of the 1979 Trade Agreement (GATT)

U.S. has urged that electrical power equipment be included in the Agreement. The extension of the present code is based on a request consultation procedure. Besides U.S. and Canada, Sweden has made such requests consultation to other member countries including the U.S. (See enclosed copy of the request to U.S.) E.g. electrical power equipment.

Thus Sweden and the U.S. have common interests in this particular respect.

Postal Address | Address | Telephone | Telegraphic Address | Telex
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Bilaga 1

REQUEST BY THE GOVERNMENT OF SWEDEN

OF

THE UNITED STATES

Department of Energy (excl. fuels)

Department of Transportation

Tennessee Valley Authority (excl. fuels)

U.S. Postal Service

Corps of Engineers

Bureau of Reclamation

Tool Commodity Center and Region 9 of GSA

Replacement of Buy National conditions on the use of Federal tied funds by subnational governments such as the buy national conditions under the Surface Transportation Assistance Act of 1982, the Rural Electrification Act, the Clean Water Act, the Clean Air Act, the Public Works Act, and the Economic Development Act with requirements of non-discrimination and code-compatible procedures.

This request list may be amended should additional information so warrant.

Mr. MYERS. Thank you, Mr. O'Hara, for your testimony.

Of the 39 sites you have, I believe in the United States you said, is there any assembly or manufacture in these 39 sites?

Mr. O'HARA. Yes, we have. Of these 2,200 people involved, probably about 1,600 are involved in the manufacturing process.

I talked about introducing technology. We introduced high voltage DC to the United States by licensing General Electric. We are building robots and are the second or third largest robotic builder in the United States—in Milwaukee now.

In addition, we have power plants, plants for building power transformers and other electrical apparatus of that nature. So, our practice is whenever we can get enough volume to justify, we start assembly. Then when the volume increases, we start the manufacturing. And always based on technologies that again is supportable in advance of what is available. So, that is the pattern we follow.

That is why we have come from a company of approximately 300 or 400 people to these 2,000 people now. We are still trying to build that kind of manufacturing base in the United States.

Mr. MYERS. We appreciate your testimony, and we appreciate your understanding of our problem here.

Similarly, Mr. Conte, the Ranking Member, has questions for you to respond to, if you would, before you leave town.

Mr. O'HARA. We will do that and keep the same time frame you have outlined for Brown Boveri.

[The questions follow:]

Questioning by the Honorable Silvio O. Conte of John J. O'Hara, ASEA, Inc.

---

1. What products does ASEA manufacture that are affected by the Buy American differential, and where are those products manufactured?

2. What is the nature of the relationship between your parent company and your U.S. entity in terms of financing, marketing, and other similar support?

3. To what degree are Sweden's utilities open to U.S. manufacturers of extra-high voltage and other electrical equipment?

4. Of the 20-30 percent of Swedish State Power Board procurements from foreign sources, how much was from U.S. manufacturers, and of that, how much was EHV equipment?

5. Of the remaining percentage of foreign purchases, how much was from ASEA subsidiaries?

6. Isn't it true that in 1972, the U.S. Trade Commission found Sweden in volation of GATT law on the dumping of electrical transformers in the U.S. market?

7. ASEA is listed as a member of the International Electrical Association (IEA), a cartel whose principal goal has been to set market prices and terms and share market information among members. While the IEA's actions have been focused outside of the U.S. market, in 1984 the cartel approved the so-called "Y" Agreement, which extended IEA efforts to the U.S. market. Would you comment on IEA activities associated with the U.S. market, and outline your company's and your parent company's participation in those activities?

8. Are there any export credit subsidies passed on to your U.S. entity from your parent company?

9. In a translation of Sweden's 1980 Procurement Ordinance, I came across several interesting phrases that should be clarified. First of all, is there a more current Ordinance or regulation for procurement in Sweden?

   a) What is the definition of the term "commerciality" used in Article 3?
   b) Article 3 also makes reference to the "use of... current standards". Whose, and what standards are being referenced? Are those Swedish national, IEA, or some other standards?
   c) The Ordinance lists three forms of procurement (straight-tender, negotiated, and direct procurement). Which is the most common form used?

10. What percentage of tenders under the Procurement Ordinance are offered without advertising?

11. While the Procurement Ordinance contains many of the features found in procurement regulations in the U.S. and elsewhere, Article 3 contains a rather interesting requirement:

> "the agency shall, in particular, make certain that there is collaboration with other agencies in the interests of the State."

a) Would you comment on the meaning and intent of that provision, and how it is implemented in practice?

b) Doesn't this sort of clearance process indicate some sort of protectionist intent, even if only indirectly?

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April 17, 1986

DICTATED BUT NOT READ

Honorable Tom Bevill
Chairman
Subcommittee on Energy and
Water Development
2302 Rayburn House Office Building
Washington, D.C. 20515

Dear Mr. Chairman:

Enclosed are answers to the questions submitted by the Subcommittee to Mr. John J. O'Hara, President and Chief Executive Officer of ASEA Inc., during his testimony on April 9 concerning inclusion of a Buy American restriction in the Energy and Water Development Appropriations for fiscal year 1987.

Sincerely yours,

William J. Baer

William J. Baer

Enclosure

cc: Honorable Silvio Conte

QUESTION 1: What products does ASEA manufacture that are affected by the Buy American restriction, and where are those products manufactured?

ANSWER: ASEA presently manufactures all of the extra high voltage equipment affected by the Buy American differential, including power transformers, reactors, circuit breakers, measuring transformers, surge arresters, and capacitors. In almost all cases, this equipment is manufactured in Sweden, although assembly and other finishing work often takes place in the United States. In addition, in a few instances, power transformers and reactors manufactured by ASEA Canada have been sold in the U.S. market.

QUESTION 2: What is the nature of the relationship between your parent company and your U.S. entity in terms of financing, marketing, and other similar support?

ANSWER: ASEA Inc. is a wholly-owned subsidiary of ASEA AB. It operates as a separate profit center within ASEA AB with independent manufacturing and marketing operations. As is typical of subsidiary/parent relationships, the financial obligations of ASEA Inc. are guaranteed by ASEA AB.

QUESTION 3: To what degree are Sweden's utilities open to U.S. manufacturers of extra high voltage or other electrical equipment?

ANSWER: There are no impediments to the sale of EHV equipment by U.S. manufacturers in Sweden. The Swedish State Power Board, which is responsible for all purchases of EHV equipment in Sweden, is governed by the 1980 Procurement Ordinance, which requires the Power Board to adhere to competitive bidding and to open its procurement process to foreign manufacturers. The other utilities in Sweden are subject to municipal regulations that impose the same requirements on their purchases of electrical equipment. Since ASEA is the only Swedish manufacturer of heavy electrical equipment in Sweden, all of these entities must invite bids from foreign manufacturers in order to meet their competitive bidding obligations.

QUESTION 4: Of the 20-30 percent of the Swedish State Power Board procurements from foreign sources, how much was from U.S. manufacturers, and of that, how much was the EHV equipment?

ANSWER: These statistics are not presently available from the Swedish State Power Board. We do know that U.S. manufacturers have entered the Swedish market and have been successful in competitive procurement conducted by the Swedish State Power Board. For example, Westinghouse has received important contracts for EHV power transformers and circuit breakers. We also understand that General Electric, through its Canadian subsidiary, received contracts for large hydro power generators in 1975 and 1979 and has participated in bidding on other projects. In recent years, U.S. and Canadian manufacturers may have been deterred from participating in Swedish procurement due to the high value of the U.S. dollar. With the significant decrease in value of the dollar over the last twelve months, competitive opportunities for U.S. manufacturers in Sweden are improving.

QUESTION 5: Of the remaining percentage of foreign purchases, how much was from ASEA subsidiaries?

ANSWER: Virtually none. In one or two instances involving medium (non-EHV) power transformers, ASEA-Lepper, ASEA's West German subsidiary, has made a delivery in order to meet a buyer's requested delivery time. As a general rule, however, all EVH equipment sold by ASEA in Sweden is manufactured in Sweden.

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QUESTION 6: Isn't it true that in 1972, the United States Trade Commission found Sweden in violation of GATT law on the dumping of electrical transformers in the U.S. market?

ANSWER: No. Although the Treasury Department investigated large power transformers from Sweden in 1972, the Department discontinued its investigation of ASEA and Sweden after determining that the instances of less-than-fair value sales were minimal. See 37 Fed. Reg. 961 (Jan. 22, 1972). At the same time, the Treasury Department found that transformers from other foreign countries were being sold at less-than-fair value, and referred those cases to the U.S. Tariff Commission (now the International Trade Commission). See 37 Fed. Reg. 961 (Jan. 21, 1972). The Tariff Commission subsequently found that imports of transformers from those other countries had injured the U.S. industry and entered an antidumping order. See 37 Fed. Reg. 8136 (April 25, 1972).

QUESTION 7: ASEA is listed as a member of the International Electrical Association (IEA), a cartel whose principal goal has been to set market prices and terms and share market information among members. While the IEA's actions have been focused outside of the U.S. market, in 1984 the cartel approved the so-called "Y" Agreement, which extended IEA efforts to the U.S. market. Would you comment on IEA activities associated with the U.S. market, and outline your company's and your parent company's participation in those activities.

ANSWER: ASEA Inc., the U.S. subsidiary of ASEA AB, has no dealings whatsoever with the International Electrical Association. ASEA AB participates as a member of the Association only with respect to the collection of statistical information, and is unaware of any Association activities that support the use of the term "cartel." The "Y" Agreement referred to in your question is dated 1974 (not 1984). It deals with the collection of statistics concerning orders received and covers all countries of the world. These activities are similar to those performed by the National Electrical Manufacturers Association in the United States. IEA

engages in no other activities associated with the U.S. market.

QUESTION 8: Are there any export credits that have been passed on to your entity from your parent company?

ANSWER: No. The only export credit subsidies received by ASEA AB are in accordance with the OECD agreement (in which the United States is a participant) that limits the use of such subsidies for exports to developing countries. Sweden grants no subsidies for exports to industrialized countries like the United States. ASEA AB does not provide or pass on any export credits to ASEA Inc.

QUESTION 9: In a translation of Sweden's 1980 procurement ordinance, I came across several interesting phrases that should be clarified. First of all, is there a more current ordinance or regulation for procurement in Sweden?

ANSWER: No.

QUESTION 9(a): What is the definition of the term "commerciality" used in Article 3?

ANSWER: The word "commerciality" is not a very good translation. A more accurate translation is that the Swedish agency must seek the most favorable terms for itself in any procurement.

QUESTION 9(b): Article 3 also makes reference to the "use of . . . current standards." Whose, and what standards are being referenced? Are those Swedish National, IEA, or some other standards?

ANSWER: With respect to procurements of heavy electrical equipment, including EHV equipment, by the Swedish State Power Board, the term "current standards"

refers to the standards of the International Electrical Commission.

QUESTION 9(c): The ordinance lists three forms of procurement (straight-tender, negotiated, and direct procurement). Which is the most common form used?

ANSWER: Minor items, such as meters and small insulators (which are not EHV equipment), are mostly purchased through direct procurement using price lists submitted by different suppliers. Virtually all larger items, including such EHV equipment as 400 KV circuit breakers and power transformers, are procured through straight-tender offers. A few very large projects involving more complex technologies, like HVDC or reactor compensation projects, are negotiated, but always in a competitive context, i.e., with more than one potential supplier.

QUESTION 10: What percentage of tenders under the procurement ordinance are offered without advertising?

ANSWER: Typically, the Swedish State Power Board sends inquiries to suppliers who have expressed interest in making sales to the Board and/or are judged by the Board to be competitive. However, all suppliers are eligible to submit a bid. As noted above, since ASEA is the only Swedish manufacturer of heavy electrical equipment in Sweden, the Swedish State Power Board must seek bids from foreign manufacturers to meet the requirement under the law for competitive bidding.

QUESTION 11(a): While the procurement ordinance contains many of the features found in procurement regulations in the United States and elsewhere, Article 3 contains a rather interesting requirement:

> "The agency shall in particular make certain that there is collaboration with other agencies in interest of the State."

Would you comment on the meeting in intent of that provision, and how it is implemented in practice? (b): Doesn't this sort of clearance process indicate some sort of protectionist intent, even if only indirectly?

ANSWER: No. The intent of this section simply is to require government agencies interested in procuring the same materials to combine their bargaining power to achieve the best possible prices from the combined volume. For example, one government agency purchases computer equipment for use by all government agencies. There is no protectionist intent or effect from the quoted condition, only an interest in seeking efficient procurement by the State.

Mr. MYERS. Thank you for your testimony.

Is there anyone else who is ready to testify this morning, or anyone who would like to testify?

There being none, the committee will stand in recess until 1:15 this afternoon.

AFTERNOON SESSION

WEDNESDAY, APRIL 9, 1986.

CENTER FOR NEW INDUSTRIAL MATERIALS

WITNESSES

HON. NEAL SMITH, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF IOWA

ROBERT S. HANSEN, DIRECTOR, ENERGY AND MINERAL RESOURCES RESEARCH INSTITUTE AND PROFESSOR OF CHEMISTRY, IOWA STATE UNIVERSITY

MICHAEL M. CROW, IOWA STATE UNIVERSITY

Mr. BEVILL. The committee will come to order.

We are pleased to have our good friend and colleague on the Appropriations Committee here, Chairman Neal Smith. It is an honor to have your testimony presented by you here and we look forward to hearing from you.

The Chair recognizes you to proceed as you wish, Chairman Smith.

Mr. NEAL SMITH. Thank you very much. I really appreciate your having started a little early today for my convenience. I am pleased to be here and to present Dr. Robert Hansen. He is the Director of the Energy and Mineral Resources Research Institute, Iowa State University.

Worldwide Iowa State University is known as an agricultural science center, the leader in everything in agriculture. But what few people do realize is that Iowa State has long been a leading source of development of new materials.

It was a part of the Manhattan project and had an important part in it. They have a metallurgy laboratory. Whenever the Space Administration or some agency wants a metal that is ten times stronger or that will take ten times as much heat, they call on Iowa State University and it has a part to do in it.

We are in that stage when we need to think about keeping up with world competition, we need to think about developing new materials that are superior in quality ahead of or at least as soon as other countries do.

Certainly Iowa State University is in a position to be an important part of that. Dr. Robert Hansen is the leading expert in that area at the present time I think, so I am glad to introduce him to you at this time.

Mr. BEVILL. Dr. Hansen, we are pleased to have you with us and look forward to hearing your testimony. I can't think of any better way for you to start off than have Chairman Smith present you.

We work very closely on the Appropriations Committee together and appreciate the good work he does here in the Congress and for the whole nation, for that matter.

Mr. HANSEN. Thank you, sir.

I have, of course, submitted written testimony and, therefore, what I will say now supplements that and condenses it a great deal. My name is Robert Hansen.

I am the Director of the Energy and Minerals Resources Research Institute, the arm of Iowa State University which operates the Ames Laboratory of the Department of Energy, the Microelectronics Research Center, the NSF University Industry Cooperative Center for Non-destructive Evaluation of Materials, and the Iowa State Mining and Mineral Research Institute.

This organization and its predecessor organization have developed processes for producing over 40 new materials over the past 45 years. Recently there has been a strong integration in the Executive and Legislative Branches of Government as well as in the public in exploiting basic research findings to improve United States technological and industrial competitiveness.

Because new materials offer important potential in this direction, and because a substantial fraction of materials research has fallen under this subcommittee's purview, I wish to point out a major problem in the transfer of basic materials research to new technology and suggest an institutional solution to it.

The basic problem lies in the short time scale, generally five years or less, over which an industry or a development agency of the United States Government expects a commitment to develop to result in a profitable operation.

The vision of this profitable operation within five years must exist before a commitment to develop is made. Most basic research findings do not lend themselves to this vision. The major problem previously mentioned is the lack of institutional provisions to cover the gap between basic research and this vision.

I call this the intermediate range applied research gap. Filling it results in engineering prototypes of instruments of processes and materials of reproducible quality available in sufficient quantities for the evaluation of their properties.

I cite two examples from my own experience. One of them has a horrible sounding name. I will just say it. The induction couple plasma atomic multi-element emission spectometer. It is a device now manufactured by 18 companies worldwide. Cadillac versions of it sell for $250,000.

It was developed in our laboratory. The evolution of this is sort of interesting because the basic proof that an induction couple plasma was an unusually efficient and unusual type of exhortation source was demonstrated many years ago but nobody was interested in developing this into an analytical instrument.

Over the next number of years we showed that this instrument could accept samples in a highly reproducible way, could analyze them by a factor of a thousand better than the original demonstration did and at that point companies all over the world began to undertake its development.

But the intermediate range applied research was critical to the vision to do that.

The second one is another material which depends on a phenomenon called giant magnetostriction. I will illustrate with this little pen. Imagine you had a crystal of material that looked just like this and you applied a magnetic field to it and it suddenly expanded and it expanded against a very powerful external force.

You might well imagine that you could make a gadget out of this, but there is some number of problems that came with the original demonstration.

In the first place, this material lost this property at temperatures well below the freezing point of ice. So, therefore, if you wanted to do something at room temperature with this material, nothing would happen.

Over a number of years other people looked into this material and a group at the Naval Surface Weapons Laboratory found they could substitute an inter-metallic compound for this material and the material then served this purpose at temperatures well above boiling water and at that point the U.S. Navy began to get very interested in it as a powerful sonar device.

Back they came to us and we found out how to grow these materials in oriented micro crystals vastly increase the power of it as a transducer and found out how to make it much cheaper than anyone had before. We believe that a contractor of the Navy is going to establish a plant and aims to make that material.

It is a brand new material, outstanding sonar material. We think it will have application in fuel injection devices but again no one was interested based on the basic research alone. One had to do something with it before people could have the vision to develop it.

It is this concept of a center for new industrial materials I want to talk about. It is a kind of an institution that the country needs and it needs more than one. It needs many of them, really, to develop basic research ideas to the point where vision of development occurs, the ideas that carry selected materials, basic research findings through the intermediate range applied research gap.

The components we envision consist of a synthesis division, a processing division and a reliability division. By and large, these things are going to wind up increasingly automated and it is sort of interesting to compare the level of automation between, let's say, modern high technology business such as the semiconducting business and an older business such as the steel business and to note the tremendous difference in reliability between those two types of technologies.

The other thing that we find very interesting about this concept is that the advanced materials are highly value added materials. They do not depend, as steel does, as coal does, on cheap access to a raw material or immediate access to markets.

They are materials where the raw materials can be anywhere and the markets can be anywhere and they are extremely well suited to the development of small businesses which, therefore, could be located anywhere including, I must say, and we have a special interest in that, places like the rural midwest, including specifically Iowa.

The kind of vision that I have with regard to the center that we would be interested in developing would be one which would take a capital cost of about $13.5 million which would require initial fund-

ing of the order of $3.5 million which would require steady state funding of the order of $5.5 million, probably half supported by industry, half supported by the Federal Government.

We envision a group of perhaps 30 people, 30 to 35 people. We envision one new material coming out every year of a sort that would develop a business of the order of $100 million a year.

As I say, this business could be anywhere. We would hope that it would be in the areas which are presently disadvantaged. The payoff for this, as we envision it, are these new businesses develop annually and generally the kind of knowledge we expect to see will improve the processing technology of the U.S. overall because I think these materials we envision would be prototypical of special materials being developed everywhere.

Mr. Chairman, that completes my oral presentation.

Mr. BEVILL. All right. Any questions?

Mr. MYERS. I have no questions. Thank you for your fine testimony. Talk about an exciting field there.

This committee is certainly interested in it. You have good representation here. I am sure Congressman Smith won't let us forget.

Mr. NEAL SMITH. Thank you very much.

Mr. BEVILL. Thank you very much, Doctor. It was a very fine presentation and you are obviously doing a great job.

Mr. HANSEN. Thank you, sir.

[The statement of Mr. Hansen follows:]

TESTIMONY OF

Robert S. Hansen
Director
Energy and Mineral Resources Research Institute
and
Distinguished Professor of Chemistry

Iowa State University
Ames, Iowa

Before

Energy and Water Appropriations Subcommittee
U.S. House of Representatives
April 9, 1986

Mr. Chairman, my name is Robert Hansen and I serve as the director of the Energy and Minerals Resources Research Institute at Iowa State University. As a part of this Institute, we operate the Ames Laboratory for the USDOE, the ISU Microelectronics Research Center and the NSF/University/Industry Cooperative supported Center for Non-Destructive Evaluation. In each of these activities, the central focus of all of our efforts is the discovery and development of new materials.

Need for a Center for New Industrial Materials

As an institution, we have been involved in the business of discovering new materials and developing the fundamental processing knowledge to produce these materials since the early 1940s. Iowa State University scientists, as a part of this effort, developed the processes for producing uranium, thorium, yttrium, as well as all of the rare earth metals and a number of other materials. From this base of knowledge, we have subsequently developed new scientific instruments and new commercially important materials which have played an important part in the development of a number of industries and in the development of several completely new businesses (see Appendix I for short review of ISU developments since 1941).

These examples illustrate the fact that the basic knowledge which we pursue, as well as that which other researchers in the U.S. pursue, can if properly nurtured lead to new business activities. Unfortunately, as a community we lack the institutional flexibility and organizational mechanisms to fully capitalize on the knowledge we produce. Basic knowledge regarding new materials and new materials

processes from which new industries might be developed is often underutilized. Our experience indicates that many of the materials discovered here at ISU could serve as the basis for totally new industries, as well as the basis for new products in existing industries. To pursue this goal, however, requires the development of a mechanism which can pull basic knowledge about materials and material processes to the point where it pushes the development of new industries.

To meet this need, we are proposing that a Center for New Industrial Materials be developed. This center will be designed to pursue the development of maximum return on our basic knowledge about materials and material processes to the point that new industries might be developed. We anticipate that should a center of the type described below be developed, that within 5 years 7-10 totally new industrial materials can be developed from our existing knowledge base. It is anticipated that each of these new industrial materials, in and of themselves, will lead to new business enterprises and totally new markets. At present, only the Japanese are aggressively pursuing research related to the development of new industrial materials, particularly special microstructures in the way we are proposing. We consider the need to be very great and the field to be wide open.

Anticipated Benefits of Program

If developed, the Center for New Industrial MAterials will potentially contribute to the nation through:

1) increase in international trade through the development of new special materials;

2) the potential development of new small businesses and markets,

3) continued development of new generic technology materials on the edge of the scientific frontier.

Each of these items is a critical element in our national effort to retain our current economic development patterns.

Benefit to the Economy

Initial estimates of the benefit of this activity to economic development indicate that 5-7 totally new industrial materials can be expected before 1992. It is estimated that the business potential for each of these new industrial materials is significant. Our past experience indicates that markets for special microstructure materials can range from $30-250 million per year for each of these materials. Markets for new industrial materials processes and instrumentation also exist and are significant.

Preliminary Prospectus

for the

Center for New Industrial Materials

Introduction

Materials research in the U.S. today is a significant enterprise involving numerous industries, universities and the government. Facilities associated with private industry focus largely on research related to specific product lines while research at government-financed facilities and universities is generally broader and more fundamental. Significant work within this array of institutions is under way on the

development of new advanced materials as well as continued basic research in fundamental material science. In FY 1984, this basic research effort was supported by the federal government at the $1 billion/year level.

The federal materials research infrastructure is funded and operated by a wide range of institutions. On the basic research side, the NSF supports materials research at 14 major centers and 8 smaller research groups. This program totals $300 million per year and represents 20% of the governments total effort. In addition, there is another 100 million in other types of project support. Among the mission agencies (primarily DOD, NBS, NASA and DOE), the government also supports a number of basic materials research activities totalling $700 million per year, or 70% of its total research investment. There is a serious need to capitalize on this basic research to bring the materials to the stage of commercial viability. This endeavor has discovered a wide range of new phenomena and has produced small quantities of a large number of very interesting new materials. What is needed now is a systematic effort to bring these discoveries to the point of industrial viability.

While there is a significant amount of research being conducted to address the problem of developing new industrial materials and replacing or extending the life of critical materials (materials that are critical to the well-being of the U.S. economy), these activities are not well integrated or well-focused. Our experience as developers of a wide range of new materials since 1940, tells us that materials research directed toward specific goals, such as the development of new

industrial materials and the extension or replacement of critical materials, requires a well-integrated program within a single research institution.

This prospectus outlines the structure and objectives for a proposed Center for New Industrial Materials.

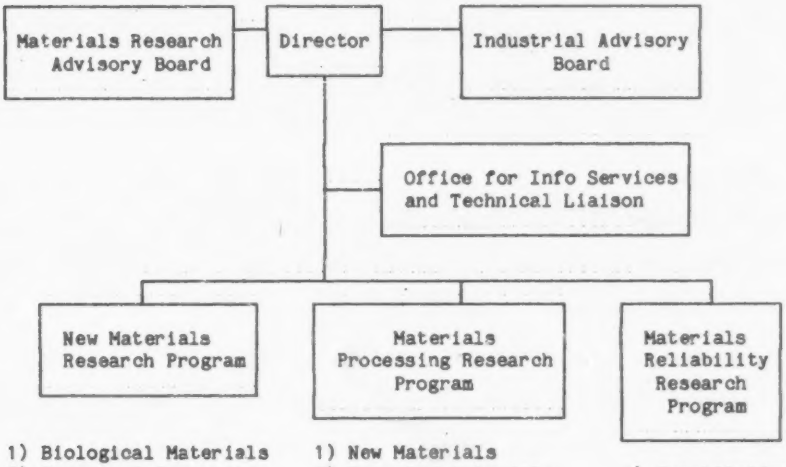
Recommended Program

New industrial materials include materials for both defense purposes and general industrial uses. A useful research program must include: synthesis of new materials and adaptation of existing materials to new uses. In addition, the efficiency and reliability of these materials should also be evaluated. A data base spanning the total array of substitute materials and their potential for service in various applications should also be established.

In this regard, Figure 1 details the program elements of the proposed Center for New Industrial Materials.
This program configuration assumes that the Center will not duplicate research activities already on-going at other federally financed or industrial centers. For instance, the advanced materials research activity would conduct projects that would contribute to generic technology development. With this value added type of research, we expect that only the most promising advanced materials would be investigated. In addition, totally new materials such as Terfenol-D, Copper-based microfilamentary alloys, and permanent magnet materials currently under development at Iowa State would be investigated as to their potential as a new industrial material.

Each of the organizational elements of the proposed center are detailed below.

CENTER FOR NEW INDUSTRIAL MATERIALS


Materials Research Advisory Board
Director
Industrial Advisory Board
Office for Info Services and Technical Liaison
New Materials Research Program
Materials Processing Research Program
Materials Reliability Research Program
1) Biological Materials
2) Ceramic & Composite Materials
3) Silicon Based Materials
4) New Inorganic Solids Rare Earth Based Materials
1) New Materials
2) Recycled Materials
3) Processing for special microstructure
1) Quantitative non-destructive evaluation techniques
2) Sensors
3) Automated Instrumentation Manufacturing Process Control.

Center Management and Proposal Review

Center management will be the responsibility of a full-time director. The director will have responsibility for daily operations, fund raising, research planning and for staffing the two advisory boards. Advising the director will be a Materials Research Advisory Board made up of materials research directors and others from around the country and an Industrial Advisory Board made up of representatives of firms participating in the Centers activities. Each of these advisory boards will also serve as the proposal selection teams on an annual basis.

Technology Assessment and Transfer

A key component of the Center will be the Office for Information Services and Technical Liaison (OISTL) which will serve as the principal technology transfer unit of the Center. It is essential that a national data base be developed on the properties and performance potential of the new industrial materials, critical materials and their possible replacements. It is anticipated that OISTL will offer on-line computer access, as well as hard copy data on existing and new materials and that, when necessary, liaison services will be offered on a cost basis to industries that wish to implement ideas derived from the data base.

Specific catalog and data services of OISTL will include:

- data on properties and reliability or new industrial materials,
- general data on the supply and demand of the various commodities for both existing and substitute materials,
- catalog and abstracting of relevant new industrial materials research.

Technical Program

The search for new materials and the evaluation of their utility is an activity common to nearly every materials research center in the country. What makes the proposed program unique is its mission, the search for and development of materials which can serve as the basis for new industries. The goal of the program is to develop materials with characteristics so unique that they can serve as a basis for the development of new industries.

To address this mission, we will create a center in which industrial and university researchers can work cooperatively to solve major problems. This requires a place to work, specialized facilities to try out ideas, a team of resident experts and the basic services to carry out research effectively. We envisage specific projects that take 1 to 3 years, although some ideas could be tried in joint projects which take only a few months. Both new materials and new instrumentation to process these materials will be developed.

New Materials Research Program

Effort initially will focus on groups of materials where the University has a demonstrated record of success. These include:

Rare Earth Based Materials

- design of materials that perform new functions such as the magnetostrictive material terfenol for sonar and other applications.
- development of new magnet materials to replace or complement samarium-cobalt and iron-neodymiun-boron ferromagnets.

Microfilamentary Metal Composites

- Copper based microfilamentary metal composites which show both very high strength and high thermal and electrical conductivity.
- Metal-metal composites which show high strength and low density for aircraft applications.
- Metal-metal composites which show very high strength at high temperature for combustion applications.

Silicon Based Materials

- design of new silicon polymer precursors for the production of high performance silicon nitride.
- design of silicon polymers for high temperature materials.
- design of organometallic precursors for new material fabrications.

New Inorganic Solids

- synthesis of new materials with unusual stability at high temperature.
- synthesis of cage and chain compounds which show very anisotropic mechanical and electrical properties.
- cobalt, chromium and platinum group replacements for corrosion resistant, high strength and magnetic materials.

Materials Processing Research Program

After a new material with promising properties has been synthesized or identified, many steps are often still required before its potential as a new industrial material can be fully assessed. The same is true for new processing techniques. Procedures must be developed which produce the knowledge base for the production of large quantities and in a form suitable for industrial use. Our experience with vanadium reduction, thermite processing of uranium and the development of terfenol-D alloys indicates that perfecting the art of production on an industrial scale also takes considerable research.

The intent of the materials processing research program will be to establish the science by which new materials industrial processing

technology can be developed on a scale sufficient to attract commercial interest. We hope to develop the knowledge base needed for optimum processing and for enhancing material reliability. We will develop the instrumentation and technology base which is needed for industrial scale processing, carrying each process through the engineering prototype stage (rather than pilot plant or demonstration plant stages, as this will be industry's role) and produce a sufficient amount of each material so that samples of a size adequate for property evaluation can be furnished to governmental agencies and private industry.

We plan to address the processing questions associated both with the new materials, developed as part of the research program and with recycled materials (a major problem at present). This includes both process development and process control requiring new analytical techniques and improved analytical instrumentation.

Processes for which a knowledge base currently exists, which would be early targets for process development, include:

- mechanical co-reduction of powder compacts to form microfilamentary metal-metal composites which combine high strength with high thermal and electrical conductivity.
- mechanical co-reduction of compacts made of expanded metal and sheet metal, to make composites which combine high strength and low density ("jelly roll" method).
- thermite reduction process for magnetic and magnetostrictive alloys.
- fabrication of new, silicon based materials derived from novel silicon containing precursors.

- processing of inorganic solids using organometallic precursors.
- processing of silicon and gallium arsenide wafers to include both passive and active elements for microelectronic circuits.
- processing of catalytically active compounds onto large area supports for the processing of chemicals.
- the development of prototype software and hardware for instrumentation to automate these processes.

In the future, more industrial process control will be performed on-line, in real time, automatically and remotely. Although liquids and gases have been analyzed in this way for decades, this has not been common for solid materials. Our experience in developing these on-line, real-time and remote analyses for spent nuclear fuel gives us a competitive advantage in this emerging technological arena. Specific examples in analytical instrumentation include:

- on-line monitoring of gases released or generated during processing.
- direct laser generation of aerosols, on a microgram to milligram scale, followed by the introduction of the aerosol into an inductively coupled plasma detector.
- direct photoacoustic spectroscopic determination of inorganic or organic compounds in solids on-line and in real time.

- laser-induced breakdown spectroscopy, laser plasma-afterglow spectroscopy and coherent anti-Stokes Raman spectroscopy to analyze materials.

Materials Reliability Research Program

An essential test that a new industrial material must meet is the integrity of the product and its reliability in service. There must be procedures to test for quality during production and to evaluate the material for probable failure after it is in service.

Materials reliability research is, for the most part, carried out as a process of assessing the probable life of a given material in a range of environments and evaluating the failed material to give empirical evidence regarding the cause of failure or to specify more accurately the life expectation. To make most effective use of a material, it is necessary to design instruments to interrogate for flaws. This includes the development of automated systems to properly interpret the results of this interrogation and make proper decisions about acceptance or rejection of parts.

To address this mission, we plan emphasis on the following areas.

Sensor Development

- Development of new classes of piezoelectric transducers for ultrasonic interrogation of materials. Emphasis will be on broad band response and multi-viewing probes.
- Development of eddy current and other electromagnetic interrogation probes.
- Development of microfocus X-ray techniques.

- Development of Superconducting Quantum Interference Device (SQUID) gradiometer systems to detect flaws.
- Development of thermal wave and photoacoustic non-contact sensing devices.

Signal Processing

- artificial intelligence and adaptive learning for the design of interrogating signals and the interpretation of the results.
- image analysis, interpretation and enhancement algorithms.
- improved and more efficient procedures for document storage.

Accept/Reject Criteria

- development of probabilistic accept/reject criteria for both materials and components based on possible failure modes, the NDE inspection results and the expected usage environment.

The particular materials of prime interest, initially, will be:

1) ceramics
2) magnetic materials
3) metal-metal composites
4) fiber reinforced composites.

Program Funding Requirements

Following an initial federal capital investment of $10-12 million over 2-3 years ($3.5 million in FY 1987), it is estimated that full scale Center operations will require an operating budget of

approximately $5.5 million per year. Following a period of initial federal support and investment, our plan is to finance the Center with approximately 50% federal resources and 50% industrial and other resources.

APPENDIX I

New Industrial Materials Developed at Iowa State University

There is a long tradition of material development work at Iowa State University and the Ames Laboratory which ISU operates, particularly in the field of metals such as rare earth and transition metals. The laboratory was founded shortly after Professors Spedding and Wilhelm developed the processes for making uranium and thorium metal during the 1940s as part of the Manhattan Project. Over a million pounds of each of these metals was made on the campus of Iowa State University and the processes were subsequently transferred to industry. Essentially, these same processes are in use today.

In the 1950s, processes for separating the rare earth elements from their ores and the subsequent reduction to metals was developed at Iowa State University. Particularly noteworthy in this effort was the development of the ion exchange process for separating the rare earths from one another. This effort included, for example, the development of processes to produce several tons of yttrium metal for a special nuclear reactor application at a time when only a few grams of material had previously been produced. Other achievements in the 1960s include the development of an aluminothermic process which is presently used for the nation's supply of high purity vanadium and the development of a process to separate hafnium from zirconium for the zircalloy needed as a fuel element cladding in nuclear reactors.

In the early 1980s, a new process for making superconducting wire for large scale magnets was developed. This so called in situ process

for niobium-silicon conductor involves the development of casting procedures for dendritic copper-silicon alloys, the development of an internal core process for introducing tin, the subsequent working into wire and heat treatment to form Nb_3Sn. Careful control of dendrite growth during casting and careful sequences of mechanical working were essential ingredients in this achievement. At the present stage of development, castings weighing 80 kg and lengths of wire measuring several miles long are being made.

The most recent material processing projects include the development of a highly magnetostrictive alloy called Terfenol-D, in collaboration with the Naval Surface Weapons Laboratory. This is a rare earth-iron material which shows an expansion of 2400 parts per million in a magnetic field of a few hundred Oersted. This material was initially developed for use in sonar projectors, but it also has other excellent potential for use in fuel injection devices, laser mirror actuators and robotic joints. Processes for casting and the dendritic growth of aligned grains of the material on a scale required for sonar applications were developed. This involved the solution of many problems in dendritic growth, grain alignment, trace element additives and second phase control.

Another opportunity for the development of new processing techniques is based on basic research in the field of copper based microfilamentary alloys. This problem is a spin-off of the superconducting wire project and involves special problems in casting and mechanical deformation to produce the product. The casting procedures used for those copper-niobium alloys in the superconducting

wire project also apply to a wide range of copper based transition metal alloys. These materials are important for their high strength and high conductivity. When drawn to wire, these alloys are composed of ribbon shaped transition metal filaments in a copper matrix and have ultimate tensile strengths in excess of 210 ksi with electrical conductivities 67% that of copper. A wide variety of other matrix and filament combinations may be possible and much research needs to be done to develop processes for these high performance materials.

In all of these developments mentioned above, there are generic problems which arise in connection with the processing of specific materials. Solutions to these problems provide a broader base of knowledge and new ways to use instrumentation which apply in whole classes of new problems as well as providing a new class of materials and subsequently new classes of industry.

WEDNESDAY, APRIL 9, 1986.

NUCLEAR RESEARCH AND DEVELOPMENT

WITNESS

HON. MARILYN LLOYD, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF TENNESSEE

Mr. BEVILL. Next will be Mrs. Lloyd. We are ready for you and you may proceed as you wish.

Mrs. LLOYD. Thank you very much, Mr. Chairman.

Mr. BEVILL. We are always delighted to hear from our good friends and colleagues.

Mrs. LLOYD. It is always nice to be here.

We appreciate you and the great friend you have been to our subcommittee. It is a pleasure to appear before this subcommittee today and to continue our longstanding partnership in support of nuclear energy and research and development programs.

I am here primarily to outline recommendations for the DOE nuclear fission, magnetic fusion, and electrical energy research programs which the Energy Research and Production Subcommittee adopted on March 13, 1986. As I told our subcommittee at markup, I believe that our subcommittees are the custodians of "fragile enterprises" in terms of the Government's nuclear development programs in fission as well as fusion.

In nuclear fission R&D we have sought to achieve critical strengthening of the program based chiefly on redirections of funding. The program must ultimately look to significant cost sharing with DOD and the private sector if we are to utilize our unique facilities efficiently. The budget which I recommended, whose thrust was not changed by two amendments, restores a balance to the defense and civilian reactor development mix in the DOE fission program.

I should point out that the R&D programs of the subcommittee have been cut $100 million from fiscal year 1986 and the total add-ons recommended restore just over 40 percent of that reduction. In magnetic fusion we are telling the DOE that the ignition project is critical to our program progress independent of the nature of an international cooperative project. I would strongly urge this subcommittee to consider the fact that without this focus for the Toroidal fusion program, the U.S. program will slip into third place in the world and international cooperation will be academic.

As for specific actions, we directed light water reactor funding from institutional activity to more high leverage DOE EPRI efforts. We restored the modular HTGR program to a level of $28 million. We appreciate the subcommittee's support in conference last year and agree with you that there should be a focus aimed at a test project in the advanced reactors program.

The MHTGR is our committee's candidate but we recognize the fact that the Department appears to be reluctant to do detailed designs because they would imply a commitment to build a test article. We added funding to the liquid metal reactor program for the IFR metal fuel concept and innovative LMR Designs and to breeder technology for FFTF fuel supply activity.

We also believed it was critical to restore the advanced robotics R&D effort in nuclear fuel cycle. We understand the differences with this subcommittee on water cooled breeder reactor technology but I must point out that we were forced to eliminate all such funding for fiscal year 1987 in view of the lack of DOE and industry interest in the data.

As a result of oversight hearings with the Space Science and Applications Subcommittee we concluded that an additional $2.5 million should be provided to fund additional RTG safety tests so that space missions can continue to be flown with these "atomic batteries."

As this subcommittee has done, we did express concerns about the relative size of the Defense Nuclear Energy Program compared to the Civilian Reactor Development Program. We recommended a slight decrease in these defense programs but would encourage the subcommittee to recognize the synergistic benefits of these growing programs to the civilian nuclear activity.

Mr. Chairman, the rest of my statement summarizes other subcommittee recommendations which we expect to have ratified by the Science and Technology Subcommittee within the next few weeks. Programs involved are Remedial Action, the Nuclear Waste Fund, Magnetic and Inertial Confinement Fusion and Uranium Enrichment, as well.

Mr. Chairman, I believe that we agree on most of these budget issues on the civilian nuclear R&D side. Let me briefly mention my concerns about defense programs.

As you know, the Y-12 plant at Oak Ridge has already been impacted by a personnel reduction during the fiscal year and I hope that any necessary reductions from the 1987 budget request will still maintain a strong national security program in DOE without any disparate reductions at the Oak Ridge complex.

There has already been a tremendous negative impact from DOE's uranium enrichment decision as well as the Gramm-Rudman 1986 adjustment. I look to the subcommittee to be even-handed as you have always been in the past and I want to thank you very much for your judicious handling of the Defense programs budget in 1986.

Finally, Mr. Chairman, although my subcommittee does not authorize any of its programs, I believe I should say a word about the Tennessee Valley Authority. As you well know, it remains a valuable institution to "the Valley" and the vision of David Lilienthal. However, it has had more than its share of public and congressional criticisms recently.

You and Mr. Myers and Chairman Whitten have always displayed vision in handling TVA issues and I look forward to working with you in seeing that TVA's nuclear power program gets back on track.

I am not impatient about the constructive efforts in this regard and I am reassured by the quality of people which have been brought onboard such as Admiral White. I would hope that we can all work constructively to help TVA weather this crisis. It ill-serves the Congress to dwell on this or to play "who shot John" with respect to the source of the current problems.

Mr. Chairman, Mr. Myers, and other members of the committee that I work with, I look forward to staying in close touch with you on these critical problems and I thank you for your help and I thank you for letting me testify today.

Mr. BEVILL. Thank you very much. We appreciate you so much. You and your subcommittee that you chair have worked so closely with this subcommittee and, of course, so many of these critical programs of the nation are based on the authorization that you pass through the Congress and get through the Congress.

I know the people of Tennessee and certainly people of the nation appreciate the leadership that you have exhibited here in the Congress as chairman of the Energy, Research and Production Subcommittee because it has meant not only a great deal to the State of Tennessee, but it has meant a lot to the entire nation.

We appreciate you and we appreciate the good work that you do and we look forward to continue working with you, too.

Mrs. LLOYD. Thank you very much. I want to thank you again for your leadership in keeping us going forward with the nuclear programs of the Nation.

Thank you.

[The statement of Mrs. Lloyd follows:]

STATEMENT OF MARILYN LLOYD

BEFORE

APPROPRIATIONS SUBCOMMITTEE ON

ENERGY AND WATER DEVELOPMENT

APRIL 9, 1986

MR. CHAIRMAN:

IT IS A PLEASURE TO APPEAR BEFORE YOUR SUBCOMMITTEE TODAY AND TO CONTINUE OUR LONG STANDING PARTNERSHIP IN SUPPORT OF NUCLEAR ENERGY R&D PROGRAMS. I AM HERE PRIMARILY TO OUTLINE RECOMMENDATIONS FOR THE DOE NUCLEAR FISSION, MAGNETIC FUSION, AND ELECTRICAL ENERGY RESEARCH PROGRAMS WHICH THE ENERGY RESEARCH AND PRODUCTION SUBCOMMITTEE ADOPTED ON MARCH 13, 1986. AS I TOLD OUR SUBCOMMITTEE AT MARKUP, I BELIEVE THAT OUR SUBCOMMITTEES ARE THE CUSTODIANS OF "FRAGILE ENTERPRISES" IN TERMS OF THE GOVERNMENT'S NUCLEAR DEVELOPMENT PROGRAMS IN FISSION AND FUSION.

IN NUCLEAR FISSION R&D WE HAVE SOUGHT TO ACHIEVE CRITICAL STRENGTHENING OF THE PROGRAM BASED CHIEFLY ON REDIRECTIONS OF FUNDING.

THE PROGRAM MUST ULTIMATELY LOOK TO SIGNIFICANT COST SHARING WITH DOD AND THE PRIVATE SECTOR IF WE ARE TO UTILIZE OUR UNIQUE FACILITIES MORE EFFICIENTLY. THE BUDGET WHICH I RECOMMENDED, WHOSE THRUST WAS NOT CHANGED BY TWO AMENDMENTS, RESTORES A BALANCE TO THE DEFENSE AND CIVILIAN REACTOR MIX IN THE DOE FISSION PROGRAM.

I SHOULD POINT OUT THAT THE R&D PROGRAMS OF THE SUBCOMMITTEE HAVE BEEN CUT $100 MILLION FROM FY86 AND THE TOTAL ADD-ONS RECOMMENDED RESTORE JUST OVER 40% OF THAT REDUCTION. IN MAGNETIC FUSION WE ARE TELLING THE DOE THAT THE IGNITION PROJECT IS CRITICAL TO OUR PROGRAM PROGRESS INDEPENDENT OF THE NATURE OF AN INTERNATIONAL COOPERATIVE PROJECT. I WOULD STRONGLY URGE THIS SUBCOMMITTEE TO CONSIDER THE FACT THAT WITHOUT THIS FOCUS FOR THE TOROIDAL FUSION PROGRAM, THE U.S. PROGRAM WILL SLIP INTO THIRD PLACE IN THE WORLD AND INTERNATIONAL COOPERATION WILL BE "ACADEMIC."

AS FOR SPECIFIC ACTIONS, WE REDIRECTED LIGHT WATER REACTOR FUNDING FROM INSTITUTIONAL ACTIVITY TO MORE HIGH LEVERAGE DOE EPRI EFFORTS IN CERTIFICATION OF ADVANCED REACTOR DESIGNS. WE RESTORED THE MODULAR HTGR PROGRAM TO A LEVEL OF $28 MILLION WHICH IS BELOW FY86. WE APPRECIATE THE SUBCOMMITTEE'S SUPPORT IN CONFERENCE LAST YEAR AND

AGREE WITH YOU THAT THERE SHOULD BE A FOCUS AIMED AT A TEST PROJECT IN THE ADVANCED REACTORS PROGRAM. THE MHTGR IS OUR COMMITTEE CANDIDATE BUT WE RECOGNIZE THE FACT THAT THE DEPARTMENT APPEARS TO BE RELUCTANT TO DO DETAILED DESIGNS BECAUSE THEY WOULD IMPLY A COMMITMENT TO BUILD A TEST ARTICLE. WE ADDED FUNDING TO THE LIQUID METAL REACTOR PROGRAM FOR THE IFR METAL FUEL CONCEPT AND INNOVATIVE LMR DESIGNS AND TO BREEDER TECHNOLOGY FOR FFTF FUEL SUPPLY ACTIVITY. WE ALSO BELIEVED IT WAS CRITICAL TO RESTORE THE ADVANCED ROBOTICS R&D EFFORT IN NUCLEAR FUEL CYCLE. WE UNDERSTAND THE DIFFERENCES WITH THIS SUBCOMMITTEE ON WATER COOLED BREEDER REACTOR TECHNOLOGY BUT I MUST POINT OUT THAT WE WERE FORCED TO ELIMINATE ALL SUCH FUNDING FOR FY87 IN VIEW OF THE LACK OF DOE AND INDUSTRY INTEREST IN THE DATA.

AS A RESULT OF OVERSIGHT HEARINGS WITH THE SPACE SCIENCE AND APPLICATIONS SUBCOMMITTEE WE CONCLUDED THAT AN ADDITIONAL $2.5 MILLION SHOULD BE PROVIDED TO FUND ADDITIONAL RTG SAFETY TESTS SO THAT SPACE MISSIONS CAN CONTINUE TO BE FLOWN WITH THESE "ATOMIC BATTERIES."

AS THIS SUBCOMMITTEE HAS DONE, WE DID EXPRESS CONCERNS ABOUT THE RELATIVE SIZE OF THE DEFENSE NUCLEAR ENERGY PROGRAM COMPARED TO THE CIVILIAN REACTOR DEVELOPMENT PROGRAM. WE RECOMMENDED A SLIGHT

DECREASE IN THESE DEFENSE PROGRAMS BUT WOULD ENCOURAGE THE SUBCOMMITTEE TO RECOGNIZE THE SYNERGISTIC BENEFITS OF THESE GROWING PROGRAMS TO THE CIVILIAN NUCLEAR ACTIVITY.

FINALLY, IN FISSION R&D THE SUBCOMMITTEE RECOMMENDED A $3 MILLION RESTORATION FOR THE INTERNATIONAL SUBSEABED PROGRAM UNDER CIVILIAN RADIOACTIVE WASTE R&D. IN MAGNETIC FUSION, AS I NOTED PREVIOUSLY, WE BELIEVE A LOW COST IGNITION DESIGN IS CRITICAL INDEPENDENT OF THE DETAILS OF INTERNATIONAL COOPERATION AND IN FACT SHOULD BE CONSIDERED A CANDIDATE FOR SUCH A COOPERATIVE VENTURE. IN ADDITION TO THE $5 MILLION ADD IN MAGNETIC FUSION, THE SUBCOMMITTEE RECOMMENDED $3 MILLION TO REVIEW CIVILIAN POWER APPLICATIONS OF INERTIAL CONFINEMENT FUSION IN VIEW OF THE RECENT SCIENTIFIC PROGRESS IN THAT PROGRAM, WHILE THE DEFENSE PROGRAMS FUNDING FOR CIVILIAN ASPECTS HAS BEEN TERMINATED. IN ELECTRICAL ENERGY SYSTEMS, WHERE WE HAVE WORKED VERY CLOSELY WITH THIS SUBCOMMITTEE, WE ADDED $9 MILLION TO RESTORE THE FUNDING TOWARD THE DOE REQUEST TO OMB.

IN REMEDIAL ACTION, WHERE WE HAVE ALSO RECEIVED STRONG SUPPORT FROM THIS SUBCOMMITTEE, WE RECOMMENDED REDIRECTION OF $5 MILLION TO ENCOURAGE PRIVATE PARTICIPATION IN THE DEVELOPMENT OF FOOD

IRRADIATION. IN THE NUCLEAR WASTE FUND, THE ERP RECOMMENDED A REDUCTION OF $50.1 MILLION INCLUDING DELETION OF MRS FUNDING WITHOUT PREJUDICE AND A REDIRECTION OF $3 MILLION FOR WASTE TREATMENT TECHNOLOGY. FINALLY, MR. CHAIRMAN, IN ENRICHMENT R&D THE SUBCOMMITTEE BELIEVED IT WAS NECESSARY TO REDIRECT $50 MILLION TO CONTINUE A STRONG EFFORT FOR COMPLETING DEVELOPMENT OF AVLIS TECHNOLOGY FOR DEPLOYMENT IN THE EARLY 90'S. WE ARE FRANKLY SKEPTICAL ABOUT PROSPECTS FOR ACHIEVING AVLIS PRIVATIZATION. AS YOU KNOW, THERE IS MUCH INTEREST IN CENTRIFUGE TECHNOLOGY AND WE ARE CONCERNED ABOUT MAINTAINING THE CAPABILITY TO MAKE MACHINES. WE HAVE ALSO RECOMMENDED A REDIRECTION OF $1 MILLION TO CONTINUE TO TRANSFER CENTRIFUGE TECHNOLOGY WHICH HAS BEEN MOVING FORWARD IN A PROMISING MANNER THROUGH FY 86. YOUR PAST SUPPORT IN PROVIDING "SEED MONEY" FOR SDI AND OTHER APPLICATIONS HAS BEEN MUCH APPRECIATED. THE TOTAL REDUCTION TO BALANCE THESE ADDS IS $51 MILLION TO BE GENERATED BY INVENTORY DRAWDOWN OF THE ENRICHMENT STOCKPILE.

MR. CHAIRMAN, I BELIEVE WE AGREE ON MOST OF THESE BUDGET ISSUES ON THE CIVILIAN NUCLEAR R&D SIDE. LET ME BRIEFLY MENTION MY CONCERNS ABOUT DEFENSE PROGRAMS. AS YOU KNOW, THE Y-12 PLANT AT OAK RIDGE HAS ALREADY BEEN IMPACTED BY A PERSONNEL REDUCTION DURING THIS FISCAL YEAR

AND I HOPE THAT ANY NECESSARY REDUCTIONS FROM THE FY87 BUDGET REQUEST WILL STILL MAINTAIN A STRONG NATIONAL SECURITY PROGRAM IN DOE WITHOUT ANY DISPARATE REDUCTIONS IN THE OAK RIDGE COMPLEX. THERE ALREADY HAS BEEN A TREMENDOUS NEGATIVE IMPACT FROM THE DOE'S URANIUM ENRICHMENT DECISION AND THE GRAMM-RUDMAN FY 86 ADJUSTMENT. I LOOK TO THE SUBCOMMITTEE TO BE AS EVEN-HANDED AS IT WAS IN THE PAST AND WISH TO ALSO THANK YOU FOR YOUR JUDICIOUS HANDLING OF THE DEFENSE PROGRAMS BUDGET IN FY86.

FINALLY, MR. CHAIRMAN, ALTHOUGH MY SUBCOMMITTEE DOES NOT AUTHORIZE ANY OF ITS PROGRAMS, I BELIEVE I SHOULD SAY A WORD ABOUT THE TENNESSEE VALLEY AUTHORITY. AS YOU WELL KNOW, IT REMAINS A VALUABLE INSTITUTION TO THE VALLEY IN THE VISION OF DAVID LILIENTHAL. HOWEVER, IT HAS HAD MORE THAN ITS SHARE OF PUBLIC AND CONGRESSIONAL CRITICISM RECENTLY. YOU AND CHAIRMAN WHITTEN HAVE ALWAYS DISPLAYED VISION IN HANDLING TVA ISSUES AND I LOOK FORWARD TO WORKING WITH YOU IN SEEING THAT ITS NUCLEAR POWER PROGRAM GETS BACK ON TRACK. I AM NOT IMPATIENT ABOUT THE CONSTRUCTIVE EFFORTS IN THIS REGARD AND I AM REASSURED BY THE QUALITY OF PEOPLE WHICH HAVE BEEN BROUGHT ON BOARD, SUCH AS ADMIRAL WHITE. I WOULD HOPE THAT WE CAN ALL WORK CONSTRUCTIVELY TO HELP TVA WEATHER THIS CRISIS. IT ILL SERVES THE CONGRESS TO DWELL ON ITS

FAILING OR TO PLAY "WHO SHOT JOHN" WITH RESPECT TO THE SOURCE OF ITS CURRENT PROBLEMS.

MR. CHAIRMAN, MR. MYERS, AND OTHER MEMBERS OF THE SUBCOMMITTEE I LOOK FORWARD TO STAYING IN CLOSE TOUCH WITH YOU ON THESE CRITICAL PROGRAMS THROUGH THIS VERY DIFFICULT BUDGET CYCLE.

WEDNESDAY, APRIL 9, 1986.

HTGR AND MAGNETIC FUSION PROGRAM

WITNESS

NORVAL E. CAREY, VICE PRESIDENT, GOVERNMENT OPERATIONS, GA TECHNOLOGIES, INC.

Mr. BEVILL. Norval, now we will hear from you.

Mr. CAREY. Mr. Chairman, Mr. Myers, Mr. Boner, thank you very much for giving me the opportunity to testify before you here today. I looked at the witness list out there as very lengthy. I will try to be brief with the GA statement and I would ask that the full statement be incorporated in the record and I will try to go through this for you very quickly in deference to the schedule that you have.

Mr. BEVILL. Without objection your entire statement will be made a part of the record and we are always delighted to have you appear before our subcommittee and look forward to hearing you.

Mr. CAREY. Thank you, sir. I am pleased to have this opportunity to appear before your committee and address the Department of Energy's fiscal year 1987 budget request for the modular high temperature gas reactor, the magnetic fusion program and also I would like to talk very briefly about the areas of the DOE defense programs in which GA technologies play a role.

As I have said, I will summarize the statement. Before your subcommittee the Department of Energy has questioned the commercial interest in an application for the modular high temperature gas cooled reactor. I am sure the committee finds this curious in light of the recent joint statement submitted to the committee by the Gas Cooled Reactor Associates, the utility organization formed more than eight years ago, representing 35 percent of the total electric generating capacity of the utility organization in the United States.

The statement was signed by major utility executives as well as five of the major nuclear industrial suppliers and architect engineers. It reinforces that there has been a long-standing commercial interest in the gas cooled reactor technology and in particular an interest in the future need for the modular gas reactor to support the small, incremental growth needs which a majority of the U.S. utilities have indicated will be their future growth pattern.

The modular HTGR has gained a critical momentum in the past year which must be sustained in order to validate and demonstrate a focused goal oriented program featuring passive safety characteristics, design and operational simplicity and competitive power costs.

Therefore, we support the fiscal year 1987 funding recommendation of $28 million for the MHTGR as recently reported by the House Energy Research and Production Subcommittee in its DOE budget recommendations both to the House Budget Committee, the full Science and Technology Committee and just a moment ago by Chairman Lloyd to you, sir.

We also request your committee recommend with appropriate report language that the Nuclear Regulatory Commission spend $2 million in fiscal year 1987 to review the MHTGR licensing plan re-

cently submitted to and accepted by the Commission from the Department of Energy.

On behalf of the entire fusion program as well as GA, we ask that you restore funds to the magnetic fusion program. Last year this committee asked the DOE to focus the fusion program and this has been done by the Department of Energy and by the community.

Recognizing the value of instilling such discipline in the fusion community, GA supported that goal. Last year this committee reduced the fusion budget to what it considered to be an appropriate bottom line. Yet OMB has arbitrarily and significantly further reduced the budget this year.

We simply cannot concur with the submitted budget Doublet III Dee, the machine at GA, which we feel is a prime example of a world class experimental device and a prime example of international cooperation, has just begun operation after an 18 month redesign construction project.

To best use this investment we should be operating the machine every week yet the submitted budget only allows operation every other week. Restoration of operating funds would increase productivity of Doublet III Dee, as well as other operating fusion devices and would certainly be a cost effective utilization of a small portion of this country's available research funds.

The space nuclear power program at GA continues to concentrate on thermionics technology in cooperation with Thermal Electronic Corporation and Raiser Associates. Your committee has been instrumental in past years in maintaining the thermionics research program and I am pleased to inform you that this year the DOE is supporting a thermionic fuel element verification program in its fiscal year 1987 budget request which will expedite development of this technology.

GA is also developing a treated power system within the Multimegawatt Terrestrial Power Project and we play an important role as fuel manufacturer and supplier for the small nuclear power source project. We at GA greatly appreciate your committee and staff's past support, guidance, cooperation and wisdom and we thank you very much for this opportunity. If you have any questions I would be pleased to try to respond.

Mr. BEVILL. Thank you, Mr. Carey, for a very fine presentation. We are always glad to hear from you.

[The statement of Mr. Carey follows:]

STATEMENT SUBMITTED FOR THE RECORD

SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

HOUSE APPROPRIATIONS COMMITTEE

UNITED STATES HOUSE OF REPRESENTATIVES

FY'87 ENERGY & WATER DEVELOPMENT APPROPRIATIONS

HIGH TEMPERATURE GAS-COOLED REACTOR PROGRAM

MAGNETIC FUSION PROGRAM

THERMIONIC FUEL ELEMENT VERIFICATION PROGRAM

SMALL NUCLEAR POWER SOURCE PROJECT

MULTI-MEGAWATT TERRESTRIAL POWER PLANT

NORVAL E. CAREY
VICE PRESIDENT
GA TECHNOLOGIES, INC.

APRIL 9, 1986

FY'87 ENERGY & WATER DEVELOPMENT APPROPRIATION RECOMMENDATIONS

Department of Energy	FY'87 Recommendation
Modular High Temperature Gas Reactor	$ 28M
Magnetic Fusion	$363M
Thermionic Fuel Element Verification	Support FY'87 DOE Budget
Small Nuclear Power Source Project	Support FY'87 DOE Budget
Multi-megawatt Terrestrial Power Plant	Support FY'87 DOE Budget
Nuclear Regulatory Commission	
HTGR Licensing Review Activities	$ 2M

Mr. Chairman and Members of the Subcommittee:

I am Norval E. Carey, Vice President of Government Operations at GA Technologies, Inc. I am pleased to have this opportunity to appear before your Committee and address the Department of Energy's FY'87 Budget Request for the Modular High Temperature Gas Reactor and Magnetic Fusion programs and areas of the DOE Defense Programs in which GA Technologies plays a role. I will also discuss our recommendations for the Nuclear Regulatory Commission's advanced reactor process and funding related to the MHTGR.

Briefly I would like to report on GA's pending change in ownership. This is especially important relative to our HTGR programs because GA has been and remains the industrial champion and vendor of gas reactor technology in the U.S. and is recognized as the primary repository of HTGR technology worldwide. Negotiations are nearing an end which we fully expect to lead to the sale of GA by Chevron to the Blue family of Denver, Colorado. The Blues are currently involved in the energy field via their ownership of gas utilities and oil and gas production activities. The Blues have indicated that the HTGR and our Doublet fusion programs as well as our recent entry into various defense areas were significant in their decision to purchase GA. They remain convinced that nuclear power will be an essential ingredient of the energy supply both in the U.S. and worldwide, and in particular, they view the modular HTGR as playing a major role in meeting this need.

Recently in answer to questions posed by this Subcommittee the Department of Energy indicated there was a lack of commercial interest in and commercial application for the MHTGR. I am sure the Committee finds this curious in light of the recent joint statement submitted to the Committee by Gas Cooled Reactor Associates, the utility organization formed more than 8 years ago representing 35% of the total electric generating capacity in the U.S. which has contributed financial support to lead to commercialization of gas reactor technology and from whose Chairman you will receive testimony later this afternoon. The joint statement indicating commercial support for the modular HTGR was signed not only by major U.S. utility executives but industrial participants such as GA, Stone & Webster, EG&G, Inc., Combustion Engineering and Bechtel Power Corporation.

In addition, GCRA recently surveyed the U.S. utilities as to their plans for future plant generating needs and found a large number of utilities which indicated they were planning for small incremental growth in their power generating equipment. Additions of 700 MW(e) or less as voiced by the large majority of the utilities fits squarely with the program direction of the modular HTGR in the 350 MWt range featuring passive safety, design and operational simplicity and the potential to achieve power costs competitive with modern coal-fired units and conventional light water reactors.

Needless to say, with this modular HTGR program gaining such momentum, we are concerned with the proposed shift in the nuclear energy strategy by the Department of Energy as stated in their Congressional budget request. This strategy, which redirects the efforts of advanced reactors, could make it most difficult for the nation to ever benefit from the potential of a system like the modular HTGR.

Therefore, we strongly support the FY'87 funding recommendation of $28M for the MHTGR recently reported by the House Energy Research and Production Subcommittee in the DOE budget recommendations both to the House Budget Committee and the full House Science Committee. This level of funding will allow the program to maintain critical momentum leading to the validation and demonstration of a focused, goal-oriented MHTGR program recognizing that private sector cost and risk-sharing arrangements will be a critical feature of the plan.

A key accomplishment over the last year was the development of a licensing plan which was submitted to and accepted by the NRC. This is aimed at supporting the submittal of a full preliminary safety information document during this current fiscal year. We therefore recommend that $2M be provided the NRC with appropriate report language to assure the Agency will perform the critical MHTGR licensing review activities.

The fusion program is now bearing the fruit of the initiatives undertaken in the late 1970s. The prognosis for satisfying the scientific requirements for fusion power remains positive and is being continuously reinforced by the rapidly increasing worldwide data base.

The budget cuts experienced by the U.S. Magnetic Fusion effort in the past two years have been absorbed primarily by downselection of alternative confinement concepts and by sharply limiting commitments to new facilities. Cognizant of the nation's fiscal status and recognizing the value of instilling such discipline in the fusion program, GA Technologies has consistently spoken out in support of these budgets. However, we cannot concur with the $333M Presidential request for the FY 1987 Magnetic Fusion budget.

The basis for this opposition is the disproportionate impact this budget will have on productivity. The core of the effort to harness fusion power is a small number of major facilities, each of which is essential to the advancement of the program as a whole. We are requesting that $30M be restored to operating funds to allow the major devices to run experiments at full levels of operation. We believe this will result in a much more cost-effective program.

The Doublet III Dee tokamak, (DIII-D), which began operating on schedule a few weeks ago at GA Technologies, serves to illustrate the point. With the largest plasma cross-section and the highest plasma current in the U.S., the start of experiments on DIII-D has been eagerly awaited by the world's fusion community. Indicative of this enthusiasm, the Japanese government has contributed to this undertaking in a major way in both funding and scientific talent. Yet the FY'87 budget for this world-class facility is significantly smaller than in past years. The Japanese have expressed concern that the budget reduction may adversely impact the schedule for conducting research for DIII-D and we share that concern. Restoration of operating funds would increase the productivity of DIII-D as well as other operating devices.

Stimulated by discussions at the summit level, the groundwork is being laid for a major international initiative in Magnetic Fusion. Although the specifics of such a proposal have not been finalized, the vehicle will be a tokamak and the scope will combine full reactor scientific conditions with several of the principal engineering challenges of fusion research. The technical basis for this proposal will be provided by the operating results of the major tokamaks in FY'87 and FY'88. The personnel operating the facilities will supply the bulk of the scientific and engineering talent mandatory for accomplishing such a project. For these reasons, it is essential to provide adequate operating funds for the major tokamaks.

The Space Nuclear Power Program at GA continues to concentrate on the development of thermionics technology in cooperation with Thermo Electron Corporation and Rasor Associates. The impressive progress in the last three years has reestablished manufacturing and testing expertise and includes testing of full-sized thermionic cells in the GA TRIGA reactors. Test results have confirmed design expectations that in-core thermionics systems can meet space power requirements from a few kilowatts to multimegawatts. Emphasis is being placed on the Thermionic Fuel Element (TFE) Verification Program which will demonstrate the technology readiness in the 500 kilowatt to 5 megawatt range. This three-year program, to begin in FY'86, will include design of a thermionic space reactor with an output of 2 MW(e) as well as testing of TFE converters in fast-neutron reactors at the Idaho and Hanford DOE facilities. The program will be supported by funds from the DOE Multimegawatt Program in FY'87. The objective of this work is to remove development uncertainties in the thermionic concept and to expedite the development of advanced converters that will provide dramatic improvements in electrode power density and efficiency.

GA is developing several thermionic reactor designs that offer great potential for application in the Multimegawatt Power Systems Program. These designs include the conventional thermionic converter approaches coupled with energy storage systems to achieve 100 to 200 MW(e) and an innovative burst power concept that can produce 100 MW(e) in a closed cycle thermionic system. We at GA firmly believe that nuclear thermionic technology has the potential for application in a broad power spectrum that can enable space missions that require compact, lightweight and survivable power systems.

GA is developing the TRIGA Power System (TPS) to provide a compact, inherently safe, and reliable power plant for the Multimegawatt Terrestrial Powerplant (MTP) Project. The TPS combines two well-established and ideally-suited technologies: the TRIGA research reactor and the organic Rankine cycle power conversion system. We were joined by Chicago Bridge & Iron, Gilbert-Commonwealth, and Mechanical Technologies Inc. for the conceptual design study completed last year. The study showed that the concept, like the TRIGA research reactor, can provide a fully automated plant that can be operated by a small technician-level staff. Both fuel logistics and site requirements are minimized resulting in power generation costs competitive with similar sized fossil-fired plants. We fully support continuation of this program which will lead to the demonstration of a nuclear system which will satisfy the requirement for secure and reliable power for ground-based SDI systems and other mission-critical military installations.

GA is also involved in the manufacture and supply of nuclear fuel for the Small Nuclear Power Source Demonstration Project and we would encourage the Committee to continue its support for this project. We believe the application of Small Nuclear Power Sources is quite broad and will extend beyond potential use with the North Warning System.

Finally, Mr. Chairman, I would like to express the appreciation of GA's management and employees for past support your Committee has provided for the programs I have discussed here today. Your program guidance and direction have been helpful in achieving many milestones in the advancement of nuclear research.

Thank you for the opportunity to testify. I would be pleased to answer any questions you may have.

BIOGRAPHY

NORVAL E. CAREY

VICE-PRESIDENT
GA TECHNOLOGIES, INC.

Norval E. Carey of Arlington, Virginia; born July 8, 1925 in Overton, Nebraska; married the former Claire Dobelbower, 5 children, 11 grandchildren; graduate Overton High School 1943, Pre-law Hastings College 1948, LLB/JD Cumberland School of Law, 1951; Active duty U.S. Navy 1943-1946; Special Agent FBI, 1951-1955; University of California Livermore Laboratory 1955; Joined General Atomic Division of General Dynamics Corp., 1964, became General Atomic Co. Washington Office Manager 1969, Vice-President General Atomic Co. 1974 to present.

Elected Secretary and Treasurer American Nuclear Energy Council, Member American Nuclear Society, American Defense Preparedness Association, National Security Industrial Association, Air Force Association, Association U.S. Army and Navy League.

WEDNESDAY, APRIL 9, 1986.

HTGR PROGRAM

WITNESS

R. F. WALKER, CHAIRMAN, GAS COOLED REACTOR ASSOCIATES

Mr. BEVILL. Mr. Walker.

Mr. WALKER. My name is Richard F. Walker. I am President of Public Service Company of Colorado and Chairman of Gas-Cooled Reactor Associates which is a utility/user organization that supports the development and commercialization of the High Temperature Gas-Cooled Reactor.

During the past several years the focus of the collective efforts within the HTGR program has been developed and HTGR design that is a concept for near-term development and deployment—I am sorry. That is responsive to the utility users requirement and eases the current institutional difficulties associated with nuclear power and optimally capitalizes on HTGR's unique characteristics.

The result of this has been the establishment of a modular HTGR as a reference concept for near-term deployment. The strong consensus of support within the program participants and the broad utility support for the modular reactor is reflected in the recent Joint Participants' Statement referred to by Mr. Carey.

This statement does indicate the advantage and why we think the modular HTGR is well suited to revive the civilian nuclear program. Its core size and power density are limited by designs such that the ceramic coatings of the fuel particle retain the fission products to an acceptable degree under all licensing basis events. The K heat removal being accommodated by the passive mechanism of radiation and conduction feature will simplify the overall concept particularly the licensing and operations activities. In addition, safety related systems and components are minimized and contained within an exact standardized nuclear island. A major portion of the nuclear island can be shop fabricated and assembled to nuclear standards facilitating enhanced quality assurance.

The balance of the plants is physically separated from the nuclear island and may be manufactured and constructed to conventional fossil plant standards.

The nuclear island is composed of independent reactor modules that can be constructed sequentially or as a cluster to more closely match load growth requirements and the utilities financing constraints. This feature will provide added flexibility and reduced financing risk that is most desirable in the current era of uncertainty for the U.S. utilities load growth forecasting.

Fundamental to the modular concept is the ability to build a one-module demonstration project at a relatively minimum cost as a demonstration basis for the multi-modular commercial plants. The plants for such a one module demonstration project are being advanced through an ongoing modular project definition study.

Phase one of the study has been completed and the objectives and requirements and scopes of the study and the detailed initial cost estimate and the overall benefits have been identified. The

study results are being used as the basis for an ongoing development of a project strategy plan. If successful, the project strategy plan will become an agreed upon foundation for the perspective utility user base project company, a perspective vendor, i.e., supply company, and a government to establish a project based program and to commit their financial support to the project.

It is recognized and accepted that the key to the success of this project is the ability of the private sector to raise a significant fraction of the funds required. Critical to the furtherance of this modular project initiative is stable Government support. Accordingly, GCRA respectfully recommends Congress provide up to $32 million including one million for capital equipment for continued modular reactor development within the DOE's advanced reactor program in fiscal year 1987.

Further, the DOE program should remain focused on the reference modular plant design, licensing, development and supporting technology development. The primary goal of the DOE program in fiscal year 1987 should be to obtain a license ability statement from the Nuclear Regulatory Commission.

This will determine at an early stage whether the NRC accepts the proposed licensing criteria, the supporting safety analysis and the technology development plan, the overall licensing approach and role of the perspective modular demonstration project in supporting the design certification for subsequent commercial plans.

These results will be essential to the private sector participants in the development of this commitment to the modular project.

In addition, it is recommended that two million be provided to the NRC for licensing review activities leading to their issuance of a license ability statement. I would like to say, Mr. Chairman, we certainly appreciate the support you and your committee have given us in the past and we look forward to working with you this year and hope we can continue to keep this very valuable program going in some very tough times.

Thank you, Mr. Chairman.

Mr. BEVILL. Very good and certainly, Mr. Walker, we hope we will continue to work closely with you. Thank you very much.

[The statement of Mr. Walker follows:]

STATEMENT SUBMITTED FOR THE RECORD
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT
COMMITTEE ON APPROPRIATIONS
UNITED STATES HOUSE OF REPRESENTATIVES

FY 1987 APPROPRIATIONS FOR
HIGH TEMPERATURE GAS-COOLED REACTOR PROGRAM

RICHARD F. WALKER
PRESIDENT OF PUBLIC SERVICE COMPANY OF COLORADO
AND
CHAIRMAN OF GAS-COOLED REACTOR ASSOCIATES

Mr. Chairman and Members of the Subcommittee, my name is Richard F. Walker, and I am President of Public Service Company of Colorado and Chairman of Gas-Cooled Reactor Associates (GCRA) which is a utility/user organization that supports the development and commercialization of the High Temperature Gas-Cooled Reactor (HTGR).

GCRA's goal is to ensure that the HTGR is established as an attractive commercial alternative for a broad range of applications in a timely manner. The approach to achieving this goal has been to establish a National Project after which commercial plants can be deployed. During the past several years, the focus of the collective efforts within the HTGR Program has been to develop an HTGR design that is responsive to the utility/user's requirements, eases the current institutional difficulties associated with nuclear power and optimally capitalizes on the HTGR's unique characteristics.

As you know, the result of this effort has been the establishment of the Modular HTGR (MHTGR) as the reference concept for near-term development and deployment emphasis. The strong consensus of support within the Program participants and the broad utility support for the MHTGR is reflected in the recent Joint Participants' Statement to this Committee and the other Congressional Committees which have oversight responsibility for the HTGR Programs at the DOE and the NRC. We heartily endorse the Joint Statement and are proud to have coordinated its preparation and submittal. A copy of the Joint Statement is attached for the Congressional Record.

As a supplement to the Joint Statement, I would like to expand on GCRA's Project development activities. From its inception, GCRA has sought to establish a National HTGR Project that would be based on an equitable cost/risk sharing between the utility/user industry, the vendor/AE industry, and the Government. While the overall environment for any civilian nuclear project has become increasingly difficult and the proposed FY 1987 budget proposals from DOE would appear to discourage our Project interests in particular, we remain committed to pursue an MHTGR Project initiative. This position is based on our conviction that the merits of the MHTGR are worthy of a National Project.

Fundamental to the MHTGR concept is the ability to build a one-module Demonstration Project, at relatively minimal cost, as the demonstration basis for multi-module commercial plants. Through an initiative begun by TVA and expanded by GCRA, the plans for such a one-module Demonstration Project are being advanced through an ongoing MHTGR Project Definition Study. Phase I of this Study was

begun last August and completed in February and was supported by all the private-sector Program participants. Through this Study, the following Project objectives have been established:

1. Demonstrate HTGR-Unique Licensing Process and Support the Design Certification for the Standard Nuclear Island.

2. Demonstrate Plant Performance Characteristics.

3. Demonstrate Operation and Maintenance (O&M) Activities.

4. Establish MHTGR Vendor and Basis for Commercial Plant Cost and Schedule.

5. Establish Utility/Investor Confidence to Buy Commercial Plants.

The Project Definition Study has established an initial definition of the Project's requirements and scope, an initial detailed estimate of the costs and schedule, and the overall benefits and specific limitations of the prospective MHTGR Demonstration Project. Summary results are reported in the Joint Statement and further details are available upon request.

The Study results are being used as the basis for the ongoing development of a Project Strategy Plan. If successful, the Project Strategy Plan will become an agreed-upon foundation for the prospective utility/user based Project Company, the prospective vendor/AE based Supply Company and the Government to establish a Project-based Program and to commit their respective financial support to the Project.

Crucial to the furtherance of the MHTGR Project initiative is stable Government support. Accordingly, GCRA respectfully recommends that Congress provide $32 million, including one million for capital equipment, for continued MHTGR development within DOE's Advanced Reactor Program in FY 1987. Further, the DOE Program should remain focused on the reference MHTGR plant design and licensing development and supporting technology development. The primary goal of the DOE Program in FY 1987 should be to obtain a licensability statement from the NRC. This will determine at an early stage whether the NRC accepts the proposed licensing criteria, the supporting safety analyses, the technology development plan, and the role of the prospective MHTGR Demonstration Project in supporting the design certification for subsequent commercial plans. These results will be essential to the private-sector participants in the development of their commitments to the MHTGR Project. In addition, it is recommended that $2 million be provided to the NRC for the licensing review activities leading to their issuance of the licensability statement.

While these budget levels will not support an aggressive Project schedule, it will sustain the existing resource base and communicate Program stability that will be invaluable for the continued development of the private-sector Project initiative.

Mr. Chairman, I appreciate the opportunity to present the utility/user support for and perspective on the HTGR Program to your Subcommittee. With your continued support, we will bring to fruition an HTGR Program that is responsive to utility/user needs and the Nation as a whole.

JOINT PARTICIPANTS' STATEMENT ON THE HTGR PROGRAM TO CONGRESSIONAL OVERSIGHT COMMITTEES

A secure, stable, and economic energy supply is vital to National security and economic well-being. Other developed countries have recognized that nuclear power is an important resource in providing this necessity. In particular, other industrialized countries such as Japan, Germany and France, as well as emerging industrialized countries such as Taiwan and Korea, have undertaken ambitious, sustained nuclear power programs to assure their citizens and industries the advantage of reliable, inexpensive energy; to reduce the constraints of dependence on foreign sources for essential commodities; and to foster their nuclear industries' competitiveness in the international market. Also, the Soviet Union and other industrialized socialist countries are continuing a methodical development and deployment of nuclear power for a broad range of energy applications.

The U.S. is struggling with how to revive its civilian nuclear power resources. Without presuming to offer a panacea, we point out that there is a clear need for stable licensing requirements and less onerous licensing procedures; easily understood and acceptable risks to investors and the public; and plant sizes, invested capital, and construction schedules that are consistent with current load growth and financial realities.

The Modular High Temperature Gas-Cooled Reactor (MHTGR) is well suited to fulfill these needs. Its core size and power density are limited by design such that the ceramic coatings of the fuel particles retain the fission products to an acceptable degree under all licensing basis events, with decay heat removal being accommodated by the passive mechanisms of radiation and conduction. This feature will simplify the overall concept, particularly the licensing and operations activities. In addition, safety related systems and components are minimized and are contained within a compact, standardized nuclear island. Major portions of the nuclear island can be shop fabricated and assembled to nuclear standards, facilitating enhanced quality assurance. The balance of plant is physically separated from the nuclear island and may be manufactured and constructed to conventional fossil plant standards. This will improve productivity, shorten the construction schedule and reduce field erection costs. The nuclear island is composed of independent reactor modules that can be constructed sequentially or as a cluster to more closely match load growth requirements and the utility's financing constraints. This feature will provide added flexibility and reduced financing risk that is most desirable in the current era of uncertainty for U.S. utilities' load growth forecasting.

The MHTGR is also well suited to supply high quality steam, broadening its market through cogeneration or direct steam/heat supply. In addition, the MHTGR has the unique nuclear capability for advancing to closed-cycle, gas turbine and high temperature process heat applications. Further, the MHTGR can be economically deployed on a once-through, low-enriched uranium fuel cycle and converted to fuel recycle and/or high-enriched fuel cycles as economics, facilities and policies warrant. Considering the profound potential contributions to National energy security; the investment to date and the relatively modest added investments that are required; the potential for international cooperation on the remaining development and demonstration as well as the broader international market potential, the Program participants submit that the continued development of the MHTGR is worthy of National commitment.

At the present, the MHTGR is undergoing its initial stage of design and licensing development. As a result of a thorough evaluation effort completed during FY 1985 within the DOE HTGR Program, the 350 MWt prismatic annular core, MHTGR has been established as the reference design for U.S. development and

JOINT PARTICIPANTS' STATEMENT ON THE HTGR PROGRAM (CONT'D)

near-term deployment. This concept makes maximum utilization of the HTGR technology, design and demonstration experience established in the U.S. The reference plant design adopts four reactor modules and two steam turbine generators for a nominal output of 550 MWe. The evaluations performed to date indicate the plant design can meet the performance, investment protection and economic requirements established through Gas-Cooled Reactor Associates (GCRA), the utility/user organization that supports the development and commercialization of the HTGR.

Ongoing DOE Program activities should remain focused on the development of the reference design and key technology areas to support the preparation of a Preliminary Safety Information Document by the end of FY 1986 for formal review by the NRC in FY 1987. The goal of that review is the issuance of a licensability statement by the NRC for the MHTGR. That will determine at an early stage whether the NRC accepts the proposed licensing criteria, the supporting safety analyses, and the MHTGR's technology development plan, including a demonstration project. Those results will be essential to the private-sector participants in the development of their commitments to the demonstration and deployment of the MHTGR.

As a complement to the DOE Program, GCRA, with cost sharing support from other industrial participants, has undertaken an initiative to develop a one-module Demonstration Project. Through successful demonstration of the licensing, construction, performance, costs and schedule of such a plant as well as the associated development of an industrial infrastructure, commercial MHTGR plants will become a reality. Estimates to date indicate that such a Demonstration Project, including several years of operation, would cost approximately $700 million ('85 dollars) with an additional $115 million ('85 dollars) required for supporting technology development. Without resource constraints, a Project could begin construction by 1990 and startup in 1994. Initiation of parallel commercial activity would permit commercial units to be deployed by the turn of the century.

Ongoing Project development activities are focused on detailed demonstration requirements and plans, establishment of Project management and supply entities, and the establishment of a Project Strategy Plan that will address cost/risk sharing arrangements. It is recognized and accepted that the key to the success of the Project is the ability of the private-sector participants to raise a significant fraction of the Project funds.

Crucial to the furtherance of any U.S. MHTGR Project initiative is stable Government support of the reference plant design and licensing development as well as the associated technology development that supports both the Project and long-term higher temperature applications. Accordingly, it is respectfully recommended that Congress provide $32 million for continued MHTGR development within DOE's Advanced Reactor Program in FY 1987. In addition, it is recommended that $2 million be provided to the NRC for licensing review activities. While this budget level will not support an aggressive Project schedule, it will sustain the existing resource base and communicate Program stability that will be invaluable for the continued development of the private-sector Project initiative and will foster the prospects for international cooperation. This recommendation is submitted within the context of a balanced, affordable U.S. nuclear strategy that deploys improved light water reactor systems for the near-term and maintains a development program for a long-term nuclear fuel breeder.

This Joint Statement is respectfully submitted to the Congressional Committees with oversight responsibility for the Nation's nuclear power development programs as evidence of the major participants' unified support for and recommendations on the HTGR Program.

JOINT PARTICIPANTS' STATEMENT ON THE HTGR PROGRAM (CONT'D)

R. F. Walker, Chairman, President & CEO
Public Service Company of Colorado
Chairman, Gas-Cooled Reactor Assoc.

James L. Everett, Chairman & CEO
Philadelphia Electric Company
Vice Chairman, Gas-Cooled Reactor Assoc.

E. A. Adomat, Executive Vice President
Florida Power & Light Company

C. H. Dean, Chairman, Board of Directors
Tennessee Valley Authority

J. D. Geist, Chairman, President & CEO
Public Service Company of New Mexico

Girts Krumins, President & CEO
Colorado-Ute Electric Association

George A. Maneatis, Exec. Vice President
Facilities & Electric Resources Devel.
and Pres. Elect, Pacific Gas & Electric

Robert J. O'Connor, President & CEO
Idaho Power Company

A. J. Pfister, General Manager
Salt River Project

Leroy W. Sinclair, President & COO
New York Power Authority

Harold W. Sonn, Chairman, President & CEO
Public Service Electric & Gas Company

Jack E. Thomas, Exec. Vice President
San Diego Gas & Electric Company

James E. Tribble, President & CEO
Yankee Atomic Electric Company

Bernard C. Trueschler, Chairman & CEO
Baltimore Gas & Electric Company

Keith L. Turley, Chairman & CEO
Arizona Public Service Company

K. Dance, President
GA Technologies, Inc.

William C. Drotleff, Vice President
Stone & Webster Engineering Corp.

Donald M. Kerr, Sr. Vice President
EG&G, Inc.

Donald E. Lyons, President
Power Systems Group
Combustion Engineering, Inc.

Howard Wahl, Vice President & Director
Bechtel Power Corporation

RICHARD F. WALKER
CHAIRMAN, PRESIDENT AND CHIEF EXECUTIVE OFFICER
PUBLIC SERVICE COMPANY OF COLORADO
AND
CHAIRMAN, GAS-COOLED REACTOR ASSOCIATES

Richard F. Walker has been President of Public Service Company of Colorado (PSCo) since his election to that position September 15, 1976. He assumed the additional duties of Chief Executive Officer in July 1978 and was elected Chairman effective September 1, 1985.

Mr. Walker's career in the utility industry began in 1949, when he entered the employ of PSCo as an assistant engineer in the Electric System Planning Department. That same month he received his degree in electrical engineering from the University of Colorado. He received the Distinguished Engineering Alumnus Award from C.U. in 1976 and was awarded the honor of Fellow in the American Nuclear Society in 1984.

Mr. Walker held various positions of management responsibility and was named Assistant Vice President, Electric Department, in December 1966. In February 1968, he was named Vice President of Engineering and Planning, Electric Department, and served in that position to the time of his election as President.

Mr. Walker's activities in engineering and the utility industry have been extensive. He is a member of five professional and technical societies and serves on the advisory committee of the University of Denver School of Business and is a trustee of the Colorado State University Foundation.

He is a member of the Board of Directors of the Edison Electric Institue, Future Fuels and the Electric Power Research Institute (EPRI), the research arm of the electric utility industry. He is currently serving as Chairman of Gas-Cooled Reactor Associates (GCRA) and is a member of the Western Regional Council. He has filled responsible positions with the National Electric Reliability Council, the Western Energy Supply and Transmission Associates (WEST) and Western Systems Coordinating Council (WSCC).

Mr. Walker is on the Board of Trustees of the Mile High United Way and is a Board member of Youth for Christ. He is President of the Executive Board of the Denver Area Council of Boy Scouts of America and is past Chairman of the Board of Presbyterian/St. Luke's Healthcare Corporation. He also serves on the Boards of Directors of Denver Civic Ventures, Inroads, Mountain States Employers Council, Colorado Alliance of Business and the Colorado Community Foundation.

WEDNESDAY, APRIL 9, 1986.

INERTIAL FUSION

WITNESS

ALEXANDER J. GLASS, PRESIDENT, KMS FUSION, INC.

Mr. BEVILL. Dr. Glass, we will be happy to hear from you. We appreciate what you and KMS Fusion are doing. I can speak from firsthand experience seeing some of the accomplishments you have done there after visiting your plants; we appreciate you very much. You may proceed as you wish. Your formal statement will be made part of the record.

Mr. GLASS. Thank you. Mr. Chairman, Mr. Smith, gentlemen, my name is Alexander Glass. I am president of KMS Fusion located in Ann Arbor, Michigan. I am honored and pleased to appear before you today.

With your permission, sir, we have submitted prepared testimony for the record. The inertial fusion program with which you are all quite familiar represents part of the questions to harness the enormous potential of fusion energy. Because of the close relation of this technology to the technology of nuclear weapons, the Department of Energy maintains this program both for its near-term benefit to national defense and for its long-term benefit as a potential source of energy.

There are six laboratories that make up the program, three national laboratories, Lawrence Livermore, Los Alamos and Sandia Laboratories and three so-called support laboratories, ours, the Naval Research Laboratory here in Washington, and the University of Rochester. The KMS Fusion is the only private company in the program.

I want to just take this opportunity to express our gratitude both on behalf of KMS and on behalf of the entire program for the continuing support this committee has shown for this program. In previous years I have come before this committee to speak on behalf of the program and on behalf of the company and today I would like to depart a little bit from previous practices.

You are all familiar with the activities of KMS, with the goals and structure of the program. Today I would like to take the opportunity to inform you of a new and exciting and we think extremely significant result just obtained in our laboratory in Ann Arbor.

The objective of laser fusion is to encapsulate a small amount of heavy forms of hydrogen, deterium and tritium in a microscopic glass or plastic container and bombard that fuel from all sides with the energy from a powerful laser or particle beam. By doing so to compress the fuel and heat it to the conditions rivaling those of the interior of the sun at which the fuel is ignited and the thermonuclear reaction takes place and energy is released. In 1974 KMS Fusion was the first laboratory in the world to demonstrate that you could indeed achieve a thermonuclear reaction in the laboratory by this technique.

Ever since that historic date efforts in the program, in fact, around the world, have concentrated on learning how to achieve

high fuel density and ultimately high fuel temperature. The achievement of high density, which is of extreme importance in this program, presents a great challenge because the fuel must be compressed first before it is heated because, as you recognize, as something gets hotter, it is harder to compress it. The issue is how can you compress the fuel without heating it.

The measure of success is the density that is achieved in the experiment and it is typically measured in multiples of the density with which you can start that is the density of the fuel. That density is about one-fifth of the density of water. In experiments conducted at KMS Fusion over the past month we have achieved record fuel densities, densities equal to or greater than those achieved in any experiment anywhere else in the world.

We have done this with a laser energy on the target of somewhere between one-fiftieth and one-one-hundredth of the energy used in other experiments. In other words, we have demonstrated not only that we can compress the fuel to densities hitherto not achieved but we can do it in a very economical and efficient fashion.

Now, how did we do this? What is it that distinguishes these experiments from experiments elsewhere? We did it using all the techniques that we at KMS Fusion have pioneered and developed over the past decade. These include using, putting the fuel in these tiny containers in frozen form, cryogenic form, and holding it at that very low temperature in a perfectly uniform layer during the experiment, using sophisticated optical techniques to control the temporal shape of the laser pulse with which the target was illuminated, using a unique optical system designed and constructed at KMS Fusion and used over the past decade to provide uniform illumination of the target.

All of this combined with some of the most sophisticated diagnostic instruments ever deployed in a laser fusion experiment. Each of these technologies, as I say, are the technologies we have worked on over the last decade. This result, which is expressed in a single number in terms of density actually represents literally hundreds of experiments and we felt it was appropriate to announce this result here before the committee because of your continuing support.

The significance of this result is it demonstrates that techniques exist and have been mastered to compress the fuel to high density efficiently. Obviously much larger lasers will be needed to combine this high density now with the high temperature required to ignite and burn thermonuclear fuel.

Let me take just a few remaining minutes to speak about our 1987 budget. In 1986, post-Gramm-Rudman, the company was funded at a level of $13.1 million. The Administration budget, which has been submitted to Congress, calls for a reduction in our funding to a level of $12 million.

This represents a net reduction in effort from where we started fiscal year 1986 prior to Gramm-Rudman of 20 percent and we urge that our budget, our operating budget, be restored to a total of 13.7 million corresponding to our current post-Gramm-Rudman level of effort.

We feel that our results and our contributions warrant at least a continuation at our current level of effort.

Finally, for fiscal year 1987, the Administration budget has only specified funds for the three smaller support laboratories, a total of about $24.5 million. The roughly $120 million of inertial fusion activity which is conducted in the national laboratories has been absorbed into the budget for weapons R&D with the level in each laboratory to be set by the individual laboratory directors.

I believe it is a measure of the esteem in which this program is held that each of the directors of the three national laboratories involved has allocated—indicated that they will allocate significant funds to the ICF program within their laboratories to maintain the effort.

But the problem is that in doing so the facilities will be shared among several programs. They will be used for strategic defense related activities, they will be used for weapons technology related activities and, for example, at Lawrence Livermore, the estimate is only 25 percent of the time on the Nova facility will be available for laser fusion.

So in conclusion, our concern is that the split in funding will diminish effort in the program, will cause the program to lose momentum and result in a diffusion of the program and a loss of achievement of milestones and goals. With that, I conclude and I thank you for your kind attention.

Mr. BEVILL. Doctor, thank you for a very fine presentation. Are there any questions?

Mr. WATKINS. Yes. He discussed the breakthrough. I heard they had a breakthrough up there and I am interested in getting more details of it.

Mr. BEVILL. It is very interesting what they have accomplished, very interesting. Thank you very much, Doctor, for your good work and for your good testimony.

[The statement of Mr. Glass follows:]

Statement on Inertial Confinement Fusion
by
Alexander J. Glass
President, KMS Fusion, Inc.

Submitted to the Energy and Water Subcommittee
of the House Appropriations Committee

9 April 1986

Summary

The 1987 Administration budget proposal calls for a reduction in operating funds for KMS Fusion from the $13.8 million appropriated in 1986, to a level of $12 million. This reduction would necessitate a 20% reduction in technical staff at KMS Fusion, and the loss of vital capabilities which do not exist elsewhere. We urge the restoration of our operating funds to a level of $13.7 million, corresponding to maintaining our current level of effort, after the recent Gramm-Rudman-Hollings reduction.

The Administration has also proposed to absorb the Inertial Confinement Fusion-related activities of the national laboratories into the Weapons Activities Research Development and Testing budget. We are concerned that this will reduce the visibility of the ICF program, lessen the accountability for ICF funding, and diminish the commitment within the laboratories toward achieving the program goals.

The Inertial Confinement Fusion Program

Fusion is the process which generates the sun's radiant energy, and which gives the hydrogen bomb its awesome power. In fusion, the fuel, consisting of the heavy isotopes of hydrogen (deuterium and tritium), is heated to a temperature of 100 million degrees, hotter than the sun's interior. At this temperature, the hydrogen nuclei fuse together to form helium, with an attendant release of energy. The fuel must be confined, i.e., held together long enough so that the energy released exceeds the energy invested to heat the fuel to the reaction temperature.

Inertial Confinement Fusion is one approach to confining and heating fusion fuel. Energy from a powerful laser or particle beam is concentrated on a spherical shell containing the fuel. The fuel is heated and compressed in the process, until thermonuclear conditions are achieved at the center, igniting the fusion reaction. The surrounding compressed fuel is then ignited by a propagating thermonuclear burn wave, releasing energy from the fusion reaction.

Inertial Confinement Fusion research has been supported by the Congress for over a decade, with two objectives. In the near term, the ICF program provides information about thermonuclear physics which is of vital importance to the nuclear weapons program. In the long term, ICF is viewed as an alternative path to harnessing fusion as a source of energy. In the Department of Energy (DOE), the ICF program is administered by the Office of Inertial Fusion, under the overall direction of the Assistant Secretary for Defense Programs.

The hydrogen bomb desonstrates that ICF is feasible on a large scale. The objective of the ICF program is to demonstrate that thermonuclear ignition can be achieved on a laboratory scale, driven by a laser or particle beam. At present, the two premier facilities available to the ICF program are Nova, a 10-beam, neodymium-glass laser at the Lawrence Livermore National Laboratory (LLNL), and PBFA-II, a light-ion beam facility located at the Sandia National Laboratories in Albuquerque. Both systems became operational in 1985. Four other laboratories are active in the ICF program. These are the Los Alamos National Laboratory (LANL), KMS Fusion, the University of Rochester Laboratory for Laser Energetics (UR/LLE), and the Naval Research Laboratory (NRL).

The Nova Project

In 1979, the DOE approved the construction of the Nova laser at LLNL. Nova was originally conceived as a 20-beam, neodymium-glass laser, capable of generating 200-300 kilojoules of infrared light in three-billionths of a second (3 nanoseconds). However, DOE only approved construction of a ten-beam system, designed to produce 100 kilojoules of infrared light, but with frequency conversion capability, to convert the output to visible light. The total project cost for Nova is approximately $180 million. Nova can operate with either two beams or ten, and is equipped with two experimental target chambers.

There are two basic approaches to driving an inertial fusion target. The laser light can impinge directly on the target (direct drive), or can be converted to x-rays in an enclosure ("hohlraum") containing the fuel mass, and the x-rays used to drive the target (radiation drive). Radiation-driven targets offer better uniformity of illumination than direct-drive targets, but sacrifice efficiency at lower laser energies. Both approaches are currently under investigation in the ICF program. Nova experiments will emphasize the radiation-driven approach, which also provides important information on the physics of nuclear weapons.

The Nova laser is currently used, not only for ICF experiments but also for experiments related to nuclear weapons physics, and the development of x-ray lasers. During 1986, experiments on Nova yielded the greatest number of thermonuclear neutrons ever achieved in an ICF experiment. The immediate goal of Nova ICF experiments is to demonstrate high density (500-1000 times liquid D-T density) at sub-ignition temperatures. Data from these experiments, along with information from other sources, will define the driver and target requirements for both ignition and high-gain targets.

KMS Fusion's Contributions to the ICF Program

KMS Fusion is located in Ann Arbor, Michigan, and is the only private participant in the ICF program. The Company has played a major role in the development of inertial confinement fusion. Fusion research at KMS Fusion began in 1971. In 1974, the world's first successful demonstration of laser-produced thermonuclear reactions took place at KMS Fusion's laboratory. Since then, the Company has contributed many other innovative "firsts" to the program. KMS Fusion was the first to carry out experiments with short wavelength light, a technique which has been subsequently adopted world-wide. The Company pioneered the use of frozen (cryogenic) fuel in ICF targets, a complex technique generally acknowledged to lead to improved target performance. In 1981, KMS Fusion scientists demonstrated that cryogenic targets perform better

than room-temperature, gas-filled targets. At present, KMS Fusion is conducting experiments which combine the use of cryogenic fuel with precise control of the laser pulse's temporal shape, to further improve target performance. Preliminary results from these experiments indicate that we have been able to compress deuterium fuel to densities as great as 150 times liquid D-T density, using only 150 joules of laser energy. This density equals or exceeds the highest value previously obtained, with lasers a hundred times as powerful as the KMS Fusion laser, Chroma. These experiments demonstrate, for the first time, that the combined use of pulse shaping and cryogenic fuel leads to fuel compression with a minimum of heating, which in turn is absolutely essential to releasing significant fusion energy with a laser of reasonable and affordable size.

KMS Fusion has contributed greatly to the development of sophisticated diagnostic instrumentation for fusion experiments. In 1983, the Company developed a multi-frame holographic interferometer for visualizing the evolution of material surrounding the surface of a target. This instrument is capable of providing stop-motion images in 20 trillionths of a second. Up to four such images can be recorded during each experiment, which lasts less than a billionth of a second. For our current investigation of cryogenic targets, we have implemented the technique of x-ray backlighting, in which an added laser beam strikes a metal target simultaneously with the incidence of the primary laser beams on the ICF target. The metal target emits x-rays, which pass through the ICF target, as it is compressed, producing a time-resolved record of the implosion history.

The Company is a major supplier of targets and target components within the ICF program. The target fabrication effort comprises roughly half of the Company's activities. This effort supports the internal research program at KMS Fusion, and produces target materials and components for the other participants in the program. Several European laboratories also buy the sub-millimeter-sized glass and polymer Microshell® fuel containers that KMS Fusion has developed for fusion use. During the past year, record neutron yields were obtained in ICF experiments conducted at the UR/LLE, the University of Osaka Institute for Laser Energetics in Japan, and at LLNL. Both UR/LLE and LLNL used fuel containers (targets) supplied by KMS Fusion in these historic experiments. In the Japanese experiments the targets were made using techniques patented in Japan by KMS Fusion, although the Japanese refuse to acknowledge the existence of our patent. In addition to target fabrication, the Company is pursuing long-term research to develop the large targets needed for the critical experiments to be performed on Nova. These targets involve several techniques and technologies developed at KMS Fusion, including cryogenic fuel, and various new target materials.

In addition to the Company's efforts in materials science and target fabrication, KMS Fusion operates a highly productive experimental facility, the Chroma laser. Chroma is a two-beam laser, capable of producing up to 800 joules of infrared light in a pulse of one billionth of a second duration. This energy can be efficiently converted to visible light, which couples more effectively to the fusion target. The laser is equipped with a pulse stacker, which allows us to synthesize pulses of arbitrary temporal shape, an important parameter for optimal target compression. The Chroma laser is outfitted with two experimental areas. This allows us to carry out one set of experiments, while setting up other experimental configurations. At present, one experimental area is devoted to a unique optical system, devised and patented by KMS

Fusion, which enables us to illuminate a target uniformly from all directions, using the light from the two beams of Chroma. Either gas-filled or cryogenic targets can be imploded in this target chamber. The other experimental area is used to explore the physics of radiation-driven targets, and to conduct other experiments on laser-matter interaction.

The Company's program of research in ICF is structured to support the primary objectives of the program. For the past five years, we have concentrated on expanding the physics data base for both radiation-driven and direct-driven targets, in anticipation of the onset of Nova experiments. KMS Fusion is the only laboratory currently conducting experiments on both kinds of targets. We are the primary supplier of fuel containers to LLNL and UR/LLE, and have initiated target development in support of classified activities in the program.

KMS Fusion's Unique Role in the ICF Program - Technology Transfer

KMS Fusion is the only private company active in the ICF program. As a private company, KMS Fusion's role is fundamentally different from that of the government laboratories or university researchers. We place greater emphasis on the support we provide the other participants in the program, and we are alert to opportunities to transfer technology developed in the fusion program to other government programs, and to commercial markets. Thus, we ensure that the maximum near-term benefit will result from expenditures made in long-term research.

Over the past few years, the Company's rate of success in technology transfer has been high. In our fusion research, we have developed x-ray detection technology with temporal, spatial, and spectral resolution. We are currently building specialized instruments based on this technology for LLNL, the U.S. Air Force Weapons Laboratory, the Defense Nuclear Agency, and the National Science Foundation. Working jointly with scientists from LANL, we have developed a commercial device for the detection of shockwaves or particle impacts, again based on ICF technology. Our technology transfer efforts are not limited to government users. KMS Fusion developed a device called a video multiplexer, which enables multiple video terminals to share access to a single hard-copy output device. We are now selling this device for use by industry in computer-aided design. Finally, we adapted the glass shells, used for fuel containers in ICF, for use as microcarriers, to support the growth of living cells for vaccine production. Two of our employees licensed the technology from KMS Fusion, and set up their own company to market the product.

KMS Fusion is active in technology transfer within the ICF program, as well. We are currently completing construction of a cryogenic target apparatus for use by UR/LLE. The cryogenic target apparatus is custom-designed, to be integrated into the UR/LLE's existing target chamber, and will be delivered in August 1986.

Contributions to Strategic Defense

The President of the United States has indicated that the highest priority program in the Department of Defense is the Strategic Defense Initiative (SDI). Most of the directed energy concepts in SDI, including laser and particle-beam weapons, have benefited from development carried out by the ICF

program. Additionally, the availability of large laser facilities within the ICF laboratories provides a ready-made test bed for both target vulnerability studies and laser technology development. KMS Fusion, like other participants in the ICF program, has played an active role in SDI-related research.

In 1984-5, experiments were carried out at KMS Fusion by a team of researchers drawn from KMS Fusion, LLNL, NRL, and Imperial College in Great Britain, which paved the way for the first successful demonstration of a laboratory-scale, soft-x-ray laser. We are continuing soft-x-ray laser research under contract with LLNL.

Over the past year we conducted a series of experiments on the Chroma laser, with Physical Sciences, Inc., to measure the interaction of intense light with target materials. These experiments will continue in 1986. Other SDI contractors have scheduled time at KMS Fusion for further laser-target interaction studies, as well as investigations of phase conjugation and stimulated Raman scattering. The Chroma facility offers SDI investigators a unique combination of flexible pulse duration, a choice of operating wavelengths, a well-characterized beam, a high data rate, strong target fabrication support, and complete facilities for data analysis.

KMS Fusion's 1987 Budget Request

In previous years, the Administration's budget request has fallen far short of the program's needs, and Congress has restored program funds to the necessary level. This year, we confront a problem of a different nature. The Administration's budget request only specifies funding for the three "support laboratories," KMS Fusion, UR/LLE, and NRL. Funding for the national laboratory programs, which totaled $120.9 million in the 1986 Appropriation, has been absorbed into Weapons Activities Research, Development, and Testing. Funding for these activities is not specified, and is in fact to be determined within the weapons laboratories themselves. It is a measure of the high esteem in which the ICF program is held, that the laboratory directors have pledged a high level of support for ICF activities within the laboratories, for 1987. However, in subsuming ICF funds under Weapons RD&T, the importance of the ICF program is diminished, its goals are obscured, and the level of commitment to the program is significantly reduced.

Within the remaining funds earmarked for Inertial Fusion, we are concerned to see a proposed reduction in funding for KMS Fusion from the 1986 level of $13.1 million (after the Gramm-Rudman-Hollings reduction) to a proposed level of $12 million, even though the program total remains effectively constant. The reduced funding level will necessitate significant reductions in our technical staff. We estimate that at $12 million in 1987, our technical staff will be reduced by 20% from its level at the the start of 1986. These reductions will cause a corresponding loss of vital capabilities within the ICF program, capabilities which do not exist in any other laboratory. The loss of KMS Fusion's capabilities in target fabrication and diagnostic instrumentation capabilities, as well as reduced availability of the flexible and productive Chroma facility, will further slow down progress toward the goals of the ICF program. We urge that our operating budget be restored to a level of $13.7 million, the amount required to maintain our post-Gramm-Rudman-Hollings level of effort into 1987.

WEDNESDAY, APRIL 9, 1986.

FUSION PROGRAM

WITNESS

STEPHEN O. DEAN, PRESIDENT, FUSION POWER ASSOCIATES

Mr. BEVILL. We have Dr. Dean. We are pleased to have you with us again and look forward to hearing your testimony. You may proceed as you wish. Your formal statement will be made a part of the record.

Mr. DEAN. Thank you. It is a pleasure to be here again. I would like to start out by congratulating Dr. Glass on this recent achievement. Fusion Power Associates is a non-profit association of about 50 corporations and electric utilities that are interested in the development of fusion. We began work in 1979 and we are attempting to coordinate the work of the private sector in this area.

We have been very appreciative of the support this committee and Congress has given to both the magnetic fusion and the inertial fusion program over the years. We are especially interested in the inertial fusion program because of the fact that it can tend sometimes to not be considered part of the fusion program by virtue of the fact it is funded in the Department as part of the weapons program and we are particularly concerned as is Dr. Glass this year that the Department has not identified how much money they intend to spend on inertial fusion this year.

They have put most of the money as just a part of their weapons budget and they have not said how much are they going to spend on inertial fusion. We are hopeful the House Arms Services Committee will specify a line for inertial fusion in their recommendations and we would urge that you adopt those guidelines if they do.

We would like to maintain an identity for that program so we all know how much money is being spent on it so we can hold the Department accountable for the progress and management of the program.

In the magnetic fusion area, I know that you, as we are, are particularly concerned with the situation at Livermore where the magnetic fusion, the mirror fusion test reactor which this committee authorized and paid for over many years is now going into mothballs without actually being operated.

This is a sad commentary on the state of affairs in science and technology generally whereas the budgeting down a lot of the commitments we made to build facilities that we needed to get results, we either cannot operate at all or in many cases as was indicated by Mr. Carey, for example, at GA and Doublet III Dee, they are under-utilized.

This committee has provided the fusion program with the facilities it needs to get the results and progress that have been promised and in those cases where we are able to operate the facilities as Dr. Glass indicated also, we are getting the results that came through.

But as the budgeting down, if the facilities are not operated or if they are delayed, we will not be able to maintain the progress that

has been promised in the past. I was particularly excited last November when President Reagan came before a joint session of Congress and announced he and Mr. Gorbachev had agreed to work together to develop fusion for the benefit of mankind. Since that time there has been intense activity in the State Department, in the Energy Department and among the western allies as part of the Versailles Summit process to work out an international plan for working together, Japan, Europe, United States and Soviet Union, to develop fusion.

We are hopeful that those plans will come to fruition and that in the future we will see much more sharing of information, divvying up of tasks so we don't all have to do the same thing and so on. The latest plan at the Department of Energy is to propose a large fusion engineering test reactor should be built in the 1990s as a three- or four-way party internationally funded project. It is going to take a lot of work to put something like that together.

I think all the countries would benefit if we can work out the arrangements to share the technology and the information and the costs. We are doing our best to help this committee with a difficult task it has.

I know everybody is up here wanting more money or as much money as before and we all know the effects of the Deficit Reduction Act and so on. The fusion program would like to maintain in 1987 about the same amount of funding it had in 1986 or we are willing to take our fair share of whatever problems this committee has.

We think the Department of Energy went a little overboard in its budget in terms of what programs it cut and how it divvied up the problems that it had. A lot of the energy programs are really down more than seems necessary for the Energy Department to do. We know that all of the authorizing and Appropriations Committee are struggling with that problem for a lot of programs other than our own and we would just like to say to the extent we can maintain our present level of effort, we will try to keep going and getting on with the job and getting the progress for which the committee has paid in the past in authorizing the facilities.

Thank you.

Mr. BEVILL. Dr. Dean, we appreciate your very fine statement. As you know, this subcommittee is very supportive of you and your program.

I remember last year I told you I hoped we could hold at least what you had the year before and the subcommittee was hoping that, too. We asked in view of the cuts that had to be made in the fusion program that the program be redirected and that was done.

It is commendable what you have done and now after you have done everything you could possibly do, then the budget comes up asking us to appropriate $50 million less than last year.

So we are hoping that certainly we can do better than that and we hope we can improve on it and we will, I am sure, as much as possible because as I said, this subcommittee is very supportive of this program and we are aware of the good work you do and your association and we appreciate you.

Mr. DEAN. Thank you. Appreciate it.

Mr. BEVILL. Any questions?

Mr. RUDD. May I ask one question?

Mr. BEVILL. Mr. Rudd.

Mr. RUDD. What countries do you think are in a position, would be available or that you would desire to be available to participate in this joint venture in nuclear fusion activity?

Mr. DEAN. I just came from a luncheon with some officials from Japan who were asking me basically the kinds of questions that I think you are interested in. The Japanese are very interested in working with the United States to develop and build a fusion engineering test reactor. The European Community works together.

All the European countries work together and they are also interested in participating in such a project. There has been a tentative agreement among the working people in fusion that such a facility might be built in the nineties and they are trying to form a joint design team.

The Soviets are also interested in somehow getting into this loop and they have brought this up at the Summit. Mr. Gorbachev brought it up with Mr. Reagan and so now we are wrestling with the question of how and whether one can bring the Soviets into this because there are problems with the Defense Department with respect to technology transfer.

There are problems with Japan and Europe, a little nervous about working with the Soviet Union also, so I don't know how all that is going to work out. But certainly the Japanese and the European Community.

Mr. RUDD. Who are we talking about in the European Community? France, Italy, Spain, England?

Mr. DEAN. They work all through the Common Market. The primary countries are West Germany, France, Italy, and England, and Spain has a small program, also.

Mr. RUDD. Thank you.

Mr. BEVILL. Any other questions by anyone?

Thank you very much, Dr. Dean.

[The statement of Mr. Dean follows:]

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STATEMENT OF
DR. STEPHEN O. DEAN
PRESIDENT
FUSION POWER ASSOCIATES
TO THE
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT
HOUSE APFROPRIATIONS COMMITTEE
APRIL 9, 1986

President Reagan, in a nationally televised report to the Congress last November following the Geneva Summit with Soviet leader Gorbachev, stated

> "As a potential way of dealing with the energy needs of the world of the future, we have also advocated international cooperation to explore the feasibility of developing fusion energy."

Furthermore, the final paragraph of the official joint statement reads

> "The two leaders emphasized the potential importance of the work aimed at utilizing controlled thermonuclear fusion for peaceful purposes and, in this connection, advocated the widest practicable development of international cooperation in obtaining this source of energy, which is essentially inexhaustible, for the benefit of all mankind."

In Japan, the February 15, 1986, edition of the Industrial Daily Press, announced that the Atomic Energy Committee of Japan was planning to build a fusion engineering test reactor during the 1990's with an estimated cost of $2 billion. The article further states

> "The nuclear fusion group is going to seek international cooperation from European countries and the United States on the basis of the plan and to take a strong posture based on the results of research that has been obtained thus far."

The article concluded

> "There is a great possibility that it will evolve into an internationally cooperated project at the Tokyo Summit to be held this May."

These events are part of a growing trend to recognize fusion development as an activity whose benefits transcend national boundaries and as an area in which cooperation can contribute to world peace and understanding as well as ensuring economic benefits to future generations.

This committee has amply demonstrated over the years its intent to fund programs where benefits to the nation are both significant and long-term. Most of the programs you support, including fusion, have their real payoff by providing the basis for long-term economic benefits to future generations of our citizens. You have always recognized that it is important to sustain the commitment to complete difficult tasks.

We in the fusion program have appreciated your support in the past and we are more committed than ever to successfully completing the task of developing fusion as a practical power source for the future. We ask that you attempt to find sufficient resources to fund both the magnetic and inertial confinement fusion programs in FY 1987 at the same levels as in FY 1986. In other words we ask that you reject the very sizable reductions proposed in the Administration's FY 1987 budget request. If you can maintain the funding at the FY 1986 level you will ensure that the facilities now in operation will be effectively utilized to obtain the scientific results for which they were built. The next few years are critical ones for demonstrating the scientific principles upon which fusion engineering test reactors will be built in the 1990's.

WEDNESDAY, APRIL 9, 1986.

MAGNETIC FUSION PROGRAM

WITNESS

HON. FORTNEY H. STARK, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF CALIFORNIA

Mr. BEVILL. Our good friend and colleague, Congressman Pete Stark, has come in so we will be glad to hear you so you can get back to your work.

Mr. STARK. Thank you very much. I have submitted for the committee some prepared testimony which stretches the ability of my scientific knowledge beyond the breaking point.

Mr. BEVILL. The committee appreciates your modesty and your formal statement will be made a part of the record.

Mr. STARK. I appreciate that, Mr. Chairman. I am going to tell you a little story about where I think we are and why I am going to ask you for another $20 million to keep this fusion project going.

As a matter of fact, you may have heard me in the past testify I wouldn't mind seeing some funds cut at the Lawrence Laboratory because I think they build too many weapons there.

Mr. BEVILL. Haven't heard you say that lately.

Mr. STARK. It is a pretty good project. Let me take you back in time to when the Chairman and I were probably just out of high school and my slide ruler was enough of a calculator to put me in charge of a project called the Atlas Project. We were going to build a missile. They didn't have any in 1954, 1955. We had two kind of guidance systems going.

We were spending a lot of money and we were going to follow—we thought we were going to do stellar guidance which is how we then guided aircraft and the B-47 fire control system was guided that way and we also had inertial guidance. So we had two parallel systems.

There was a long time when we thought we were going to end up with inertial guidance, take a reading on Polaris and guide our missiles that way. Were that the case, had we decided to scrap one of these systems back in 1955, 1956, we would still be trying to direct our missiles with a sextant and stars and literally not be able to fly them on a cloudy day.

I would submit to the distinguished members of the subcommittee that is where we are doing here. I have not heard any testimony that suggests to you that the alternate system is better.

If we do that I would tell you to go right ahead and scrap this one. It would be pretty silly sitting here and telling you to pour money—we have got $350 million in the system that you are going to mothball when perhaps another $20 million would let us find out.

I am willing to say once we know scientifically that we have the best system to get us to fusion energy, which many of us who dislike fission energy because of its environmental problems or because of its safety problems, I think we all agree we want to get

towards fusion. What is the best way to go? If I knew the answer or if you did, if the scientists could tell us, I would say pick the best way. We don't know that yet. I am saying this is a good, if you will pardon the expression, crap shoot.

It seems once we have spent the $350 million to close it down, not knowing we would look awful silly if this in hindsight turned out to be the better system. What I am saying is either make them equal if you have to pare them both down, keep going with whatever you can afford to give both systems, but why knock out a system until we know that we are knocking out the system that is clearly less desirable.

I guess that would summarize my recommendation with the committee today. If we have to close them both down because of Gramm-Rudman, all right. But if not, let's see if we can't keep this parallel track and have a little competition between these scientists to see who is going to come up with the best system.

With that, Mr. Chairman, that is the sum and substance of what I would urge you to do.

Mr. BEVILL. That is a very good and thoughtful statement, as you always make. I know this subcommittee is sympathetic to the points you have made there.

It would certainly be false economy to close down a $350 million when $20 million would——

Mr. STARK. I don't think we can afford or the scientific community will want to proceed for the next ten or fifteen years or they tell us perhaps by the turn of the century we will have a workable fusion system. I don't think we will be doing both, but I think it is premature.

I don't think the scientific community is willing to bet with any certainty that we have got the best system yet. It seems it is somewhat short-sighted.

Mr. BEVILL. We will certainly work with you and I hope we can accomplish what you have set out to accomplish.

Mr. MYERS. Would $20 million give us an answer, Pete?

Mr. STARK. What I have been told, you have $15 million in mothball costs so another additional $20 or $35; that you could continue at a slower speed? You stretch it out and not have them mothball the system. Whether that will get an answer or not, I can't tell you. That is beyond my comprehension.

I am suggesting these are reputable scientists and I am sure they are in the other project and I think scientists are probably a lot less emotional than you and I are about a lot of our political feelings, but I think until somebody can make a statement that one is clearly going to work and the other is not, and there is a possibility that either may work, we ought to explore both avenues.

Mr. MYERS. Thank you.

[The statement of Mr. Stark follows:]

TESTIMONY OF REP. FORTNEY H. (PETE) STARK

ON FUSION ENERGY RESEARCH AND THE LAWRENCE LIVERMORE LAB
Before the Committee on Appropriations
Subcommittee on Energy and Water Development

Mr. Chairman, Members of the Committee:

I appreciate the opportunity to appear today.

I've watched the fusion budget for years in hopes that we maintain our budgetary and policy commitments for the pursuit of a successful fusion facility. But as you know funding for the Energy Department's fusion program has been on the steady decline in recent years. The FY '87 budget again proposes to cut the fusion program, this time by 9 percent.

Fusion power is a smart energy source. It is clean, safe and virtually inexhaustible. Although its commercial applications require more years of study and development, it promises to advance the field of physics and pave the way for a new, untapped energy source. Eventually it could end our dependence on foreign oil.

The President's budget proposes to pick up most of the savings by ending research on mirror confinement systems. This proposal would mothball the just-completed and never-used Mirror Fusion Test Facility-B (MFTF-B) at the Lawrence Livermore National Laboratory.

A lot of hard work and money has been invested in the world's largest superconducting, tandem mirror fusion experiment. For close to 8 years some of the finest scientists and engineers in America have dedicated their time and energy to the project. $350 million dollars have been invested in MFTF-B.

Just one month ago 300 persons from the Lab and community as well as representatives from more than 100 companies that helped build the facility gathered together for a formal acceptance ceremony. But a black cloud hung over the group. Although the group was happy and proud that together they had made a magnificent technical achievement, the budget doesn't allow for the completion of the project. At this point, MFTF-B will never be run.

I have been told by staff at LLNL that $20 million more in their budget would allow the operation of MFTF-B at a reduced level. It is obviously not the optimum solution, but facing the deficit that we do, it is a compromise solution.

Recently the tragic accident of the Challenger left us horrified at the loss of life and technological investment. We did not have

control to prevent that horrendous event. Here we are faced with a loss that is certainly less tragic, yet it is still a terrible waste of human talents, time, energy and money. But, we have some control over the situation.

As the old saying goes, a picture is worth a thousand words. The Lab supplied me with pictures of the facility which I'd like to share with you today. As you see the facility is truly an incredible accomplishment. Even to those who have not had years of scientific training, the enormous complexity of the project can be appreciated. Please let me repeat: 8 years of dedicated manpower and $350 million dollars have been pumped into the MFTF-B.

With $20 million in additional investment we can reap a wealth of knowledge from the project. Without the additional funding, the $350 million will be utterly wasted. It will be like we had burned the previous $350 million dollar bills because we couldn't find another $20 million.

In 1980 under the Magnetic Fusion Engineering Act, we made a commitment to develop fusion as a viable energy source for this country. Scientists had intended the MFTF-B project as one of the two options in the search for a way to harness fusion. In not allowing the project to run, we are not upholding our commitment.

Let's not lose this momentum our scientists have been able to build over the years. I hope you can find savings in other areas which will enable this committee to learn from the $350 million investment at Livermore.

Thank you.

WEDNESDAY, APRIL 9, 1986.

ENERGY RESEARCH COMPLEX

WITNESSES

HON. BUTLER DERRICK, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF SOUTH CAROLINA

JAMES B. HOLDERMAN, PRESIDENT, UNIVERSITY OF SOUTH CAROLINA

FRANCIS T. BORKOWSKI, EXECUTIVE VICE PRESIDENT AND PROVOST, UNIVERSITY OF SOUTH CAROLINA

DAVID P. RINKER, SYSTEM VICE PRESIDENT FOR FACILITIES PLANNING, UNIVERSITY OF SOUTH CAROLINA

Mr. BEVILL. Next is Butler Derrick and his group.

Your formal statement will be part of the record, and we will look forward to continuing to work closely with you on these projects that you have supported so strongly for so many years.

Mr. DERRICK. Thank you, Tom.

Mr. Chairman, it is a real pleasure to be here before you and to introduce to you Dr. James B. Holderman, who is President of the University of South Carolina. Dr. Holderman is here today to request funding from the Department of Energy for construction of facilities for an energy research complex at the University of South Carolina. I will let Dr. Holderman give you the details of this project, but I do want to say that I feel very strongly that this is the sort of project that we should be funding.

The University of South Carolina is a fine institution with a proven track record in the field of energy research. The energy research complex represents an innovative, multidisciplinary approach to such crucial issues as exploration of sources of energy, energy conservation, environmental effects of energy production, and disposal of wastes from the production process. It is very important that these problems are adequately addressed before we are faced with a new energy crisis.

I want now to introduce Dr. James B. Holderman. We, in South Carolina, are very proud to have him as President of our university. He took over a very good university in 1977, but under his leadership the university has made great strides and earned well-deserved national recognition as an exciting center of intellectual activity.

Mr. BEVILL. Thank you very much.

Mr. HOLDERMAN. Mr. Chairman, members of the subcommittee, my name is James Holderman. I am President of the University of South Carolina.

I brought with me today Dr. Francis Borkowski, on my right, and Mr. David Rinker, on my left.

We, in South Carolina, are fortunate, we believe, to have Mr. Derrick represent us in Congress. I thank him for his gracious remarks. We hope he will continue to represent us in the years ahead.

I would like to also thank you, Mr. Chairman, the members of the subcommittee, and other members of our South Carolina delegation, for this opportunity to draw attention to what we believe is one of the most important projects in the South. Our prepared

statement details some specific facts about the university, its age—it is one of the oldest universities in the country, supported by public funds continually since 1801.

Mr. BEVILL. Is it all right if we use that in our campaign, too?

Mr. HOLDERMAN. Yes, sir. Anything I have available, Mr. Chairman, you can use in your campaign.

USC ranks as a major research university. Its research growth has been 31 percent over the last year and 100 percent over the last eight years. We have achieved national prominence in chemistry, geology, geography, mathematics, physics, biology, marine and environmental sciences; and these are particularly relevant to our proposed energy research complex.

To our knowledge, the few American universities which have established Energy related research centers concentrate their efforts in areas such as energy technology, fusion, electrical transmission, fossil fuel, economic/demographic aspects and energy planning. The Energy Research Center at USC will add a unique dimension to U.S. research capability by encompassing research on energy production as well as the effects on the environment of various energy sources and uses, on global economics, on human value considerations, education and public policy.

Our first undertaking of the research complex in three phases will be a new facility. It is the John E. Swearingen Engineering Building, and it is already under construction. We brought a rendering of that, if you would like to see it.

It is coming out of the ground. It is very exciting to us. It is being supported by private funds.

Mr. MYERS. I see you cut corners on that building.

Mr. DERRICK. This is the Bevill wing right over here. The Myers wing will be right down here on the other side.

Mr. MYERS. On the left?

Mr. HOLDERMAN. It depends on how you are looking at it.

Mr. DERRICK. We have a part for you, Mr. Rudd, too.

Mr. BEVILL. I am already impressed with the project.

Mr. HOLDERMAN. I think I will quit right here, Mr. Chairman.

I would like to say a couple more things, because there are two other phases to the project. Across the street from that facility are some extensive buildings which have been given to the university, valued at about $7 million by the South Carolina Gas Company, and they will be refurbished to complete the graduate and undergraduate Swearingen Center.

We have underway plans for the Science Center at the graduate level to be principally funded from the State Bonding Authority.

The total project will be about $48 million; $31.5 million of it approximately will be devoted to construction. We have raised about $15 million for the Engineering Center itself. These are due both to the university's capabilities and the research disciplines, and to the high regards for John Swearingen—a distinguished graduate of the university and native of South Carolina, by the way, whose wife is a native of Alabama, coincidentally—and we are therefore requesting contribution by your subcommittee, Mr. Chairman, of an appropriation of $16.5 million toward the construction costs of the energy research complex. Counterpart funding is of at least that

amount, a significant portion of which comes from the private sector.

We have the money available to complete construction, provide equipment to cover future operating costs, and we are not asking for a continuing commitment of Federal funds. A more detailed proposal was attached to the statement. I believe it has been distributed to the subcommittee.

But, Mr. Chairman and members of the subcommittee, thank you again for your attention and consideration of this request. I assure you of the commitment of the University of South Carolina to creating a facility dedicated to energy research and development.

[The statement of Mr. Holderman follows:]

BEFORE THE
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT
COMMITTEE ON APPROPRIATIONS
U. S. HOUSE OF REPRESENTATIVES

Ninety-ninth Congress, Second Session

Statement of
Dr. James B. Holderman
President, University of South Carolina

April 9, 1986

Mr. Chairman and members of the Subcommittee, my name is James B. Holderman. I am the President of the University of South Carolina, and I appear before you today to testify on behalf of the Energy Research Complex of the University to be constructed on the University's main campus at Columbia, South Carolina.

First, I would like to express my appreciation to you, Mr. Chairman, to the members of the Subcommittee and to Congressman Derrick and the members of our South Carolina delegation for this opportunity to draw your attention to one of the most important projects, we believe, in the South.

Mr. Chairman, The University of South Carolina was founded in 1801 as South Carolina College and is the oldest institution of higher education in the country to be continuously supported by public funds.

Since World War II, USC has steadily increased the amount of research conducted at the University and the results are very gratifying. Investment in research and other sponsored programs totaled more than $26 million in fiscal year 1984 - 1985, up 31% from the previous year and over 100% from eight years ago.

A distinguishing feature and a focal point of our research has been its multi-disciplinary approach and international thrust. The changing nature of research requires new facilities to promote cooperation across disciplines in order to deal with difficult real-life scientific and engineering problems. This need was highlighted by the Government - University - Industry Research Roundtable at its recent conference entitled "What Research Strategies Best Serve the National Interest in a Period of Budgetary Stress?" We at USC have been implementing such approaches for some time now. For example, since 1973, USC's Earth Sciences Resources Institute has achieved eminence in geological exploration in North Africa, the Middle East, Europe, and South America by the use of satellite imagery and computerized mapping technology. Academics and students from 44 domestic and 26 foreign universities have participated in ESRI research programs to date. Much of the cost of this research is paid for by the private sector and government agencies in the U.S. and abroad.

In this hemisphere, USC has conducted research and provided technical assistance in such varied fields as business, education, aquaculture, and malaria control and we have linked our expertise with the national interest through international

convocations such as the Caribbean Conference of July 1984. This event brought together Caribbean heads of government with President Reagan on our campus to consider ways in which to build on the progress already achieved under the Caribbean Basin Initiative.

USC has a number of outstanding departments throughout the physical and life sciences, as well as the social sciences and humanities. But we come before you today to address our plans in engineering and energy. Here the research strengths that we have developed in chemistry, geology and geography, mathematics, physics, biology and in marine and environmental sciences are particularly relevant. Our planned Energy Research Complex will capitalize on these strengths to make a unique contribution to the nation's research capability in the crucial area of energy.

USC's Energy Research Complex will be undertaken in three phases. First, a new facility, the John E. Swearingen Engineering Building, is already under construction. Second, adjacent buildings donated by the South Carolina Electric and Gas Company and valued at approximately $7 million will be refurbished to complete the Swearingen Engineering Center.

Third, a Graduate Sciences Research Center, now being planned, will complete the Energy Research Complex. The configuration and construction of the facilities will be designed in ways which will serve as a model for other laboratories and will seek to encourage creative research and teaching.

The Energy Research Complex at the University of South Carolina will supplement and will not duplicate similar research centers at other universities. To our knowledge, the few American universities which have established energy-related research centers concentrate their efforts in areas such as energy technology, fusion, electrical transmission, fossil fuel, economic/demographic aspects, and energy planning. The Energy Research Complex at the University of South Carolina will add a unique dimension to U.S. research capability by encompassing research on energy production as well as the effects on the environment of various energy sources and uses, on global economics, on human value considerations, education and public policy. These are areas of particular strength and research interest at the University of South Carolina. We would also include other disciplines from public health and business administration to law and medicine as well as chemistry, geology

and engineering so that our Energy Research Complex would become one of the most comprehensive research centers of its kind.

Of the total estimated cost of $48 million for the entire complex, $31.5 million will be devoted to construction. I am pleased to say that our fund raising efforts to date have generated approximately $15 million from private sources for construction costs. These commitments are due both to recognition of the University's capabilities in the research disciplines which will be housed in the complex and to the high regard in which John E. Swearingen, a distinguished graduate of the University, is held throughout this nation.

I am therefore requesting consideration by your Subcommittee, Mr. Chairman, of an appropriation of $16.5 million toward the construction costs of the Energy Research Complex. Counterpart funding of at least that amount, a significant portion of which comes from the private sector, is available to complete construction, to provide equipment and to cover future operating costs of the Complex. No continuing commitment of Federal funds is requested.

A more detailed proposal is attached for your reference.

Mr. Chairman and members of the Subcommittee, thank you again for your attention and consideration of this request. I assure you of the commitment of the University of South Carolina to the creation of a facility dedicated to the highest standards of excellence in research, teaching and service.

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A PROPOSAL TO ESTABLISH AN ENERGY RESEARCH COMPLEX AT THE UNIVERSITY OF SOUTH CAROLINA

UNIVERSITY OF SOUTH CAROLINA
COLUMBIA, SOUTH CAROLINA 29208

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Appendix

A PROPOSAL TO ESTABLISH AN ENERGY RESEARCH COMPLEX AT THE UNIVERSITY OF SOUTH CAROLINA

I. The Problem

Problems related to energy are already substantial and can be expected to grow -- an inevitable concomitant of increasing energy consumption in developed and developing countries.

Probably no other issue affects the quality of life so deeply. Its potential to benefit or to harm humanity is immense. Increasingly, people are concerned about energy, a fact hammered home in South Carolina from its experience with disposal of radioactive and other dangerous waste. In addition, the University of South Carolina (USC) knows from the experience of its Earth Sciences & Resources Institute (ESRI), perhaps the most active university-based service attempting to help developing countries locate and evaluate sources of petroleum, what a struggle this process poses for these nations.

Energy-related problems are comprehensive and include discovery and exploration of sources, efficiency in recovery, transport, conservation, safety, waste disposal and effects on humans and the environment.

Increasingly, energy-related problems, especially those related to end-products of energy consumption such as pollution of land, water and air, disposal of waste and radiation, are global in implications, ignoring national, geographic and even geologic boundaries.

From a scientific standpoint, the solution to these problems involves many disciplines, but this fact creates another problem: few if any research centers in industry, in government or in universities possess the array of scientific disciplines, the qualified scientific expertise and the facilities to mount a truly comprehensive interdisciplinary approach to the spectrum of energy-related problems.

The University of South Carolina does possess many of these capabilities and proposes to establish an Energy Research Complex

(ERC) whose primary concern will be the quality of life. The Complex will not limit its concerns to scientific aspects alone because of the University's awareness that issues of public policy, education and other value considerations are crucial. Because many of these capabilities already exist at USC, the establishment and organization of the Energy Research Complex will be speeded and it will be able to focus more quickly on research, teaching and dissemination of information on energy-related problems.

II. What the Complex Will Do

Energy-related problems are extensive, complex and inter-related. They range from source discovery to waste disposal, from health restoring to life destroying. The challenges posed in establishing the Energy Research Complex, therefore, include technical and organizational dimensions which could be formulated as follows:

1. How to improve energy-related research by expanding multidisciplinary research in the basic and applied sciences such as chemistry, physics, engineering and computer science,

2. How to extend the multidisciplinary research efforts to include other disciplines such as environmental health, marine science, public health, medicine and others,

3. How to take cognizance of the human value dimensions of energy-related problems by involving expertise from disciplines such as government and public policy, business administration, law, philosophy (ethics) and others,

4. How to involve expertise available in government, industry, other universities and elsewhere, recognizing that the capabilities of any institution are limited and that energy-related problems will challenge the best expertise that can be brought to bear on any given problem.

III. Other Research Centers

The Energy Research Complex proposed for the University of South Carolina will supplement and will not duplicate research centers at other universities.

The University of Texas has established a Center emphasizing energy technology, especially fusion and the University of Oklahoma's Center stresses economic and demographic aspects and fossil fuel, especially oil, in the Southwest and off-shore.

Other significant research groups and their emphases include:

Princeton University	Fusion
Georgia Institute of Technology	Electrical Transmission
Virginia Polytechnic Institute	Fossil Fuel
Massachusetts Institute of Technology	Energy Planning
Resources for the Future	Supply and Demand
Institute on Applied System Analysis (Vienna, Austria)	The World View

To this list would be added:

University of South Carolina	Fiber Optics
	Environmental Effects (Air, Terrestrial and Marine)
	Human Value Considerations (Public Policy & Education)

By addressing the environmental and human value dimensions of energy-related problems, USC's Energy Research Complex will add a unique and significant resource. In addition, the USC Energy Research Complex specifically plans to organize itself to involve expertise available at research centers outside of USC in multidisciplinary research, thereby increasing the value of that expertise.

IV. Energy Savings in Construction

With ground already broken for USC's new, privately-funded Swearingen Engineering Center and planning underway for the new Graduate Science Research Center (GSRC), this proposal to establish an Energy Research Complex is particularly timely.

These plans for new construction and renewal will incorporate state-of-the-art energy-saving methods and will symbolize the purposes of the Energy Research Complex.

Specifically, it is hoped that the construction, the environment and the configuration of the buildings can be used in ways which will serve as a model for other teaching/laboratory facilities and can be used creatively to support research and pedagogical activities in energy to be carried on inside.

Plans call for making the GSRC a "smart building", using state-of-the-art technology in energy savings. The GSRC will house many of the components of the Energy Research Complex.

The target for energy consumption in these new buildings averages 120,000 BTU/ft.^{2}/year. Both passive and active means will be employed to achieve this goal.

Passive means include:

1. The southern orientation of buildings.

2. Reduced or controlled fenestration on the southern exposure.

3. Protected glazing on the northeast side and in the courtyard.

4. Employment of natural shading on the southern exposure by means of building overhangs and other architecture.

5. Light wells and secondary reflective surfaces for natural illumination of interior space.

Active means to achieve the energy goal include:

1. Organization of interior space to zone areas with around-the-clock use (e.g., computer area) for energy savings and for security purposes.

2. Use of best techniques available in sensors and in component management for control of energy usage.

3. The hillside location and the environment of the buildings will also be used for energy conservation. The height of the buildings offers the opportunity

to use rooftop solar collectors and the potential exists for underground energy storage if these approaches prove to be cost-effective. (Previous construction nearby confirms that this is feasible.) Employment of these construction methods in an urban environment may produce a model which other universities and laboratories will find useful in their construction plans.

The configuration of the buildings (Appendix C) will facilitate scientific/pedagogical objectives of the Energy Research Complex in two ways, first by bringing facilities for the marine, terrestrial and the natural sciences together, and second, by locating some of the elements of engineering (e.g., the High Voltage Laboratory) and computer science in the Graduate Research Center/ Energy Research Complex with the new engineering building nearby.

Placing the Graduate Science Research Center near the undergraduate science building also will permit able undergraduates greater exposure to the dynamic, interdisciplinary environment which will prevail in the Energy Research Complex and the Graduate Science Research Center and should exert a positive effect on these abler students to become the energy researchers of the future.

V. The Capabilities of the University of South Carolina

The University of South Carolina possesses the relevant disciplines, the experience in energy-related research and pedagogy and the administrative and managerial skills necessary to meet the challenges listed above. In addition, USC offers the international commitment and expertise needed to make the Energy Research Complex a world-class facility.

1. The Basic Sciences

The Department of Energy (DOE) funded research at this university from 1980-85 (Appendix B) in the amount of $3,077,212 and this does not include all energy-related research. The research covers a broad spectrum of challenges - particle theory, source discovery, transport and handling of waste among others.

Researchers are active in low, middle and high energy physics. To illustrate, Dr. Yakir Aharonov, co-discoverer of the Aharanov-Bohm Effect, has extended the understanding and applications of quantum theory; Dr. Frank Avignone is pursuing the

explanations of matter in his work on double-beta decay, and his efforts have already succeeded in improving substantially the measuring capability in low-energy work.

A current basic research project involves a recently formed cooperative agreement between the University of South Carolina, Harvard University, Battelle Pacific Northwest Laboratories and the Max Planck Institute in Munich with a goal of producing a functioning bolometric neutrino detector for application to basic neutrino experiments. This detector would also be capable of playing an important role in reactor safety and reactor safeguards because it could measure directly the beta heat of the reactor and hence the thermal trends within. At present there is no known technique to do this directly.

In geology, Dr. Robert Hatcher heads a team planning to drill the deepest hole in the free world to test a number of questions important to basic and applied research.

The Earth Science and Resources Institute (ESRI), one of USC's specialized research centers, is known throughout the world for basic and applied research related to discovery and evaluation of petroleum sources.

Dr. Richard Adams' work on catalysis has made important contributions to improving and speeding chemical processes and the College of Engineering's explorations in high voltage environments and materials for switches is significant for the transport of electricity.

The work of Drs. Caruccio and Geidel has reduced acid mine drainage by as much as 95% in test coalmine fields in West Virginia, an accomplishment which is all the more significant in view of the fact that South Carolina has no coal resources to provide even experimental opportunity.

The geology department's investigations of rock porosity, radioisotope measurement, and radioisotope removal from water has important implications for waste disposal and other energy-related applications.

The work of Dr. Ehrlich in robotic vision is a splendid contribution to expediting certain kinds of geologic research. Moreover, world-class laboratories have already been established in the following areas:

Image analysis,

Radioisotope geochemistry,
Stable isotope geochemistry, and
Ground water geochemistry.

Recent developments inside and outside this university illustrate how the Energy Research Complex will further interdisciplinary research and university/industry initiatives already underway.

USC's Dr. Hideaki Kobayashi has invented a fifth generation computer chip about the size of a postage stamp that can perform up to 20 million calculations per second - 100 times faster than current VLSI (Very Large Scale Integration) chips of a similar technology. Kobayashi's invention opens new possibilities to other work in the College of Engineering in coding/decoding signals in fiber optic transmissions.

Each of these developments is of considerable interest to the Pirelli Cable Corporation, which will soon relocate its fiber optic manufacturing facility to a site near USC. Pirelli is also actively considering moving its worldwide research and development (R & D) facilities to the same site. The Pirelli Corporation is also aware that much of the development work on the NCR Tower computer was completed through USC's Center for Industrial Research.

The research development at USC in computer hardware and fiber optics in addition to the expanded capabilities in the manufacture and industrial research by one of the world's leading firms in fiber optics creates a strong base for new developments in fiber optic technology in relation to energy at the proposed Energy Research Center.

2. Environmental Health, Marine Science, Public Health

In 1985, USC's Department of Environmental Health established a multidisciplinary Environmental Health Sciences Research Center (EHSRC) to improve research capability in the following areas:

1. Hazard assessment
2. Environmental quality assessment
3. Exposure measurements
4. Health effects
5. Product evaluation

The work of EHSRC will be vital to many questions of interest at the Energy Research Complex. The University of South Carolina is establishing the EHSRC at its own expense and the facility will

be part of the University's contribution to the Energy Research Complex. This is important because if EHSRC did not exist it would have to be created for the ERC to accomplish its mission.

The Baruch Institute's extensive expertise and facilties will be a vital part of the Energy Research Complex. because the Baruch Institute has succeeded so well in fostering multidisciplinary research, its usefulness as a model for developing the Energy Research Complex is presented more extensively below.

USC's School of Public Health administers the EHSRC, the International Center for Public Health Research and possesses excellent capabilities in biostatistics and public health education. In energy-related matters, the School has been particularly active with the Baruch Institute in research and teaching related to the effect of pollution on marine life. The School of Public Health also sponsored a conference entitled, "Public Health Consequences of Outer Continental Shelf Development" which addressed the impact of such development on on-shore infrastructure, the economy, the population and the standard of living; health and air quality interactions and its effects on social and administrative aspects of resource management. The facilities and the services of the School of Public Health would be an integral part of the Energy Research Center.

3. The Human Value Disciplines

The emphasis of the proposed Energy Research Complex on the quality of life will involve other disciplines concerned with economics, law and other human values. These include:

Business Administration
The Law School
The Department of Government and International Studies
The Department of Philosophy (Ethics)

Attention to these aspects of energy-related problems needs to be strengthened. Research, conferences and publications at USC already have dealt with such topics as public policy in relation to energy transport, off-shore drilling, and the transport and disposal of waste.

USC's College of Business Administration provides the exclusive service to the State of South Carolina of conducting economic impact studies on a regular basis and in that content has evaluated, with other departments, electricity and such natural resources such as water, and aspects of coal and oil. In addition,

a number of faculty have special interest and expertise in energy-related problems.

Dr. George Haimbaugh, an expert in admiralty law, has addressed such practical problems as ocean tanker pollution.

A Review of energy-related accomplishments could be continued, but attention should be directed to one of the primary expectations of the Energy Research Complex; namely, its role in taking basic sciences and other academic disciplines already existing and coordinating their efforts in interdisciplinary approaches to complex energy-related questions. The Baruch Institute for Marine Biology and Coastal Research uses all the natural sciences in training specialists in marine and coastal environment studies, providing USC valuable experience in conceptualizing and managing such complex activities.

Secondly, the Center will be expected to extend the involvement and the use of expertise and resources existing in the private sector, government and other universities. From its beginning, USC's Earth Sciences and Research Institute has worked in this way in its geologic studies and petroleum research. The administrative foundation and the management skills which the University has evolved from these highly successful efforts will be used as a model to guide the development of the Energy Research Complex.

VI. The Baruch Institute Model

Established in 1969, The Baruch Institute is comprised of well-equipped laboratory and classroom facilities at USC's main campus in Columbia and at Hobcaw Barony, a 17,500 acre research facility located on the Carolina coast.

Hobcaw Barony provides opportunity for research in a variety of habitats. The reserve includes a pristine salt marsh, ocean beaches and dunes, a high-energy tidal inlet, marine bird rookeries, oyster banks, clam beds, many miles of tidal creeks, and a complete ecological progression from ocean to coastal highland environment. Offshore is a broad continental shelf, the Gulf Stream, and the Blake Plateau for those with open-ocean research interests.

The North Inlet Estuary, the eastern boundary of the Barony, is unique for marshland-estuarine ecosystem studies. It has been designated an Experimental Ecological Preserve by the National Science Foundation in recognition of the value of this site to the national research program for estuarine and marine research

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studies. In addition, it is the only marine site included as part of the Long-Term Ecological Research Program of the National Science Foundation, a ten year research effort involving eleven universities.

Each of these natural areas provides an invaluable setting for field research in energy-related, marine and human health problems.

The Baruch Institute typically makes use of the array of natural sciences in training specialists in the marine and coastal environment. The Baruch Institute has also reduced many turf concerns of departments so that faculty share ideas and participate in interdisciplinary research.

The Belle W. Baruch Library Series in Marine Science represents one of the results of these interdisciplinary efforts. Fifteen books have been published to date on a wide range of marine science topics, including pollution. The publications are based on symposia which bring together the best international multidisciplinary expertise available to address specific topics.

In addition to publications and symposia, the Baruch Institute has employed faculty sabbaticals and exchange relationships with other universities here and abroad to enrich its teaching and research.

Publication of a multidisciplinary series on international energy conferences which promote this approach, and the other enrichment devices noted above would be included in the services which the Center for Energy Research would provide.

In energy-related matters the Baruch Institute already has been particularly active in many dimensions of marine and aerial pollution with some activity in areas such as the hydrogen economy, estuarine transport processes and others.

For example, in 1978 it convened a conference on oil tanker transportation. The seminar was attended by representatives from independent tanker owners, the marine insurance industry, various federal and state governmental units, international and admiralty lawyers, environmental groups, economists and scientists from a number of universities. Presentations addressed the role of the tanker industry in transport of energy resources, protection of the marine environment, pollution prevention initiatives and tankers and the impact of new laws and regulations on the tanker industry.

VII. The ESRI Model

Expertise in USC's Earth Sciences and Resources Institute (ESRI) will also be used in the ERC but, equally important, ESRI's experience and current methods of operation can serve for modelling purposes in the proposed Energy Research Complex. To summarize briefly, ESRI began in 1973 when a group of USC geologists began research on plate-tectonic development of continental blocks which would lead to a better understanding of the evolution of the earth and the distribution of mineral resources in northern Africa. At the time, this work constituted the NSF's most heavily funded program, exclusive of oceanography.

In these projects, as many as fifty scientists from other universities in the U.S. and abroad were involved in the studies and this pattern has been continued.

This early work, funded by government sources (NSF), had obvious industrial applications and industry became involved more extensively in funding new work as ESRI's progams and scientific credibility became better known.

Today, ESRI plays a vital role for industry and for government agencies alike, conducting sophisticated and multidisciplinary scientific geologic investigations which neither the private nor the public sector has the resources to perform or can accomplish as cost-effectively. Its experience in managing large dollar commitments, working with industry, government and experts at many universities and in solving logistical problems to bring expertise to bear on problems in far-away lands will serve the proposed Energy Research Center well.

VIII. benefits

Benefits from the Energy Research Complex will accrue not only to the University of South Carolina but also to the United States and the scientific community.

At the University of South Carolina, savings will result from sharing equipment but, more importantly, the cross-fertilization of expertise in multidisciplinary approaches will produce better research. The training will also prepare graduates for a multidisciplinary approach to post-graduate research and employment which will become increasingly important in solving energy problems in the future.

Scientifically, the Energy Research Complex would be equipped to deal at one university with some of the complicated problems of

energy -- from discovery of energy resources to disposal of waste. because many of the relevant disciplines are already established at the University of South Carolina, the Complex will be able to use these resources efficiently and effectively without the expensive burden of creating each of these capabilities.

Using the ESRI model described above, the Energy Research Complex will make more productive and efficient use of available expertise and other resources by initiating cooperative efforts with scientists from other universities, industry and government.

IV. USC's International Commitment

Discovery of sources of energy, disposal of waste and other energy-related problems are not parochial but involve every country in the world, whatever its stage of development. A Research Complex which addresses energy's effects on the quality of life must possess the interest, the insight and the relationships with the world community and its leaders so that relevant knowledge, the fruits of research and fresh approaches can be brought to bear on these international concerns.

The University of South Carolina invests significant amounts of its resources in international projects. This investment includes money, faculty expertise, research and training.

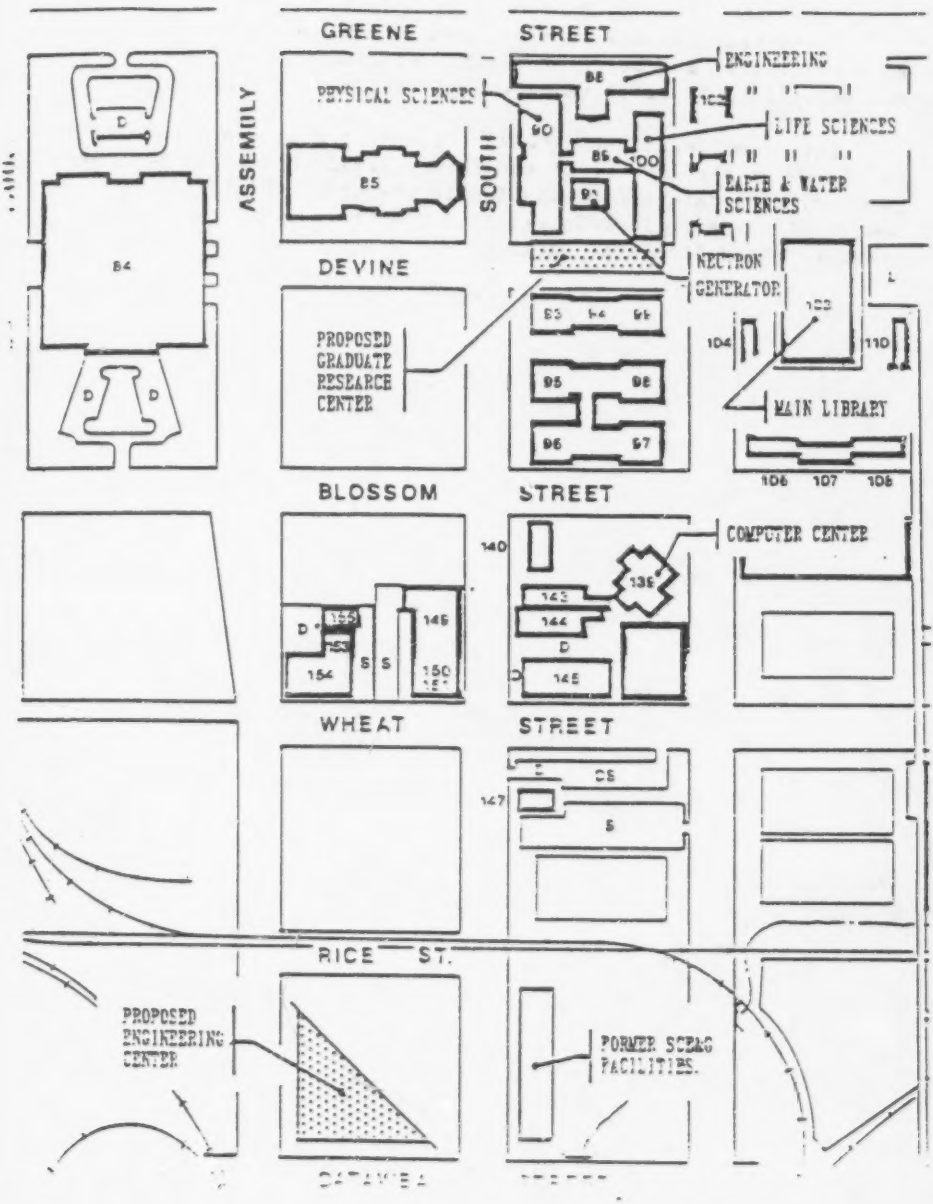
In doing so, the University expects to assist other countries by sharing its capabilities and to help itself by stimulating faculty, enhancing research and enriching its academic environment. This commitment extends throughout the University at all levels - top administration, faculty and staff.

The System-wide James F. Byrnes International Center coordinates and supports the international activities of the University of South Carolina, including the Earth Sciences and Resources Institute, the Belle W. Baruch Center for Marine Biology and Coastal Research, its Masters in International Business Studies (MIBS) program, Hotel, Restaurant and Tourism Administration, and the department of Government and International Studies, which offers the undergraduate major, M.A. and Ph. D. studies specifically in the field of international studies.

In this hemisphere, the University of South Carolina has assumed a leadership role by convening the meeting of Heads of Caribbean Nations in 1984, which President Reagan attended, and the Western Community Conference in 1985, attended by Vice President George Bush and other world leaders.

These meetings are only the more visible expression of the many scientific and teaching activities conducted by USC faculty and scientists in practically every country on the globe.

This commitment and extensive international experience will be placed in the service of the Energy Research Complex so that it, too, will make a contribution to the world which will be a source of pride to this University, the State of South Carolina and the United States of America.


GREENE
STREET
ENGINEERING
PHYSICAL SCIENCES
LIFE SCIENCES
EARTH & WATER SCIENCES
NEUTRON GENERATOR
ASSEMBLY
SOUTH
DEVINE
PROPOSED GRADUATE RESEARCE CENTER
MAIN LIBRARY
BLOSSOM
STREET
COMPUTER CENTER
WHEAT
STREET
RICE ST.
PROPOSED ENGINEERING CENTER
FORMER SCRAG FACILITIES.

Mr. BEVILL. Thank you very much for your fine statement. We will continue to work closely with Congressman Derrick and hope we can accomplish this.

Mr. DERRICK. On the way in, Mr. Chairman, I left a free pass in Rules for the next five years.

Mr. BEVILL. We appreciate you getting our rule on the Rules Committee.

Butler has always come through for us when he knows it has been very tight.

Mr. DERRICK. Thank you very much.

WEDNESDAY, APRIL 9, 1986.

NUCLEAR REACTOR PROGRAM

WITNESS

WARREN P. CHERNOCK, VICE PRESIDENT, ADVANCED NUCLEAR SYSTEMS, NUCLEAR POWER SYSTEMS, COMBUSTION ENGINEERING, INC.

Mr. BEVILL. Mr. Chernock, we will be pleased to hear from you.

Mr. CHERNOCK. Mr. Chairman, members of the subcommittee, I am pleased to have this opportunity to comment on some aspects of the DOE fiscal year 1987 budget request for nuclear fission research and development programs.

I request my written statement be made part of the record. My oral comments will concentrate on the modular HTGR, a program for which your committee has continued to provide important foresight and support. However, in the near term, the best opportunity to restore the nuclear option is to build upon proven light water reactor technology.

Thus, we are pleased to note the cooperative effort between DOE and the Electric Power Research Institute in the development of detailed requirements for future LWRs and certification of designs incorporating these new requirements. This combined effort aims at ensuring that lessons learned during the operation of light water reactors are fed back into design requirements and that resultant design changes will involve NRC early in the design process to achieve design certification in an efficient, responsible and expeditious fashion.

This cooperative effort between DOE, EPRI, NRC, utilities, reactor vendors and architect-engineers represents a unified and cooperative national program which will be vital in restoring the nuclear option by building on proven LWR technology.

Combustion Engineering is totally supportive of this program, and we recommend that the proposed funding level for this effort for fiscal year 1987 remain intact, even in light of our recommended increases in the fiscal year 1987 funding for the modular HTGR.

I would like to again commend the foresight which your committee has recognized concerning the inherent safety characteristics of the modular HTGR and the importance of this program to this nation. HTGR program participants have pooled their efforts to arrive at a design to become the focal point of a unified national HTGR program.

This design is a 350-megawatt thermal side-by-side steel vessel reactor with prismatic fuel and an annular core. It is this design which now forms the basis of a PSID being pursued by DOE.

The selection process emphasized utility user and regulatory requirements against which design concepts were evaluated. These requirements now form the basis for continued modular HTGR design efforts.

In addition, a licensing plan for the modular HTGR was accepted by the NRC and forms the basis for the PSID submittal to NRC in fiscal year 1986.

There is a need for formation of a strong industrial team with clear responsibility and authority to design and construct a demonstration plan. The Combustion Engineering record for engineering excellence in project and systems management of nuclear systems, combined with a strong HTGR technology base provided by GA Technologies, provides the basis for formation of such a team.

Combustion Engineering and GA Technologies have exercised a Memorandum of Understanding concerning a joint venture HTGR company. However, as a result of the sale of GAT by Chevron, this Memorandum of Understanding requires assessment by the new owners. We feel confident that this industrial team will emerge as the flag-ship for the HTGR program, both with respect to design, development, and construction of a demonstration plan, as well as future commercialization of HTGRs.

Although budget restraints are severe, this program deserves your attention for increased funding in fiscal year 1987 to maintain the momentum which was difficult to achieve and for which your committee should be proud.

Mr. Chairman, let me reiterate Combustion Engineering's support of the modular HTGR program. We recommend that the budget for fiscal year 1987 for the modular HTGR be increased to the $32 million level recommended in the Joint Participant Statement, which is attached to Mr. Walker's written testimony. We recommend that $2 million be provided to the NRC to provide a basis for adequate licensing review and the issuance of a license ability statement.

The modular HTGR and the modular liquid metal reactor have different roles within the DOE Advanced Reactor Program. We recommend that development of both concepts be continued. We recommend that the modular LMR funding level proposed by the House Subcommittee on Energy Research and Production, chaired by Representative Lloyd, be retained.

Mr. Chairman and members of this committee, I thank you for the opportunity to provide comments.

[The statement of Mr. Chernock follows:]

STATEMENT SUBMITTED TO SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT
SUBCOMMITTEE ON APPROPRIATIONS UNITED STATES HOUSE OF REPRESENTATIVES
FY 1987 DOE Budget Request for Nuclear Fission R&D Programs
Warren P. Chernock, Vice President, Advanced Nuclear Systems
Nuclear Power Systems, Combustion Engineering, Inc.
April 9, 1986

Mr. Chairman and members of the Subcommittee, I am pleased to have this opportunity to comment on some aspects of the DOE FY 1987 Budget Request for Nuclear Fission Research and Development Programs.

SUMMARY

In the near term, the best opportunity to restore the nuclear option is to build upon proven Light Water Reactor Technology. The cooperative effort between DOE and the Electric Power Research Institute (EPRI) in the development of detailed requirements for future LWRs and certification of designs incorporating these new requirements is an important facet in restoring the nuclear option. We recommend that the DOE proposed funding level for this effort for FY 1987 remain intact, even in light of our recommended increases in FY 1987 funding for the Modular HTGR.

The Modular High Temperature Gas Cooled Reactor has unique characteristics which are particularly useful in achieving the objectives of the advanced reactor program. This is the only one of the advanced concepts which can withstand a total loss of coolant. Its high temperature capability makes it uniquely suited for applications in addition to electricity generation. Such applications include process heat, the transportation industry and other high energy consumption industrial sectors. The DOE MHTGR Program has gained significant forward momentum during the past year. A consensus design has been developed by DOE program participants. This design is a 350 MW thermal side-by-side steel vessel reactor with prismatic fuel and an annular core. It is this design which now forms the basis of a PSID being pursued by DOE. An objective to obtain an initial statement of licensability from the NRC will require adequate funding for both DOE and NRC in FY 1987. In particular, we recommend that the budget for FY 1987 for the MHTGR be increased to the $32M level recommended in the Joint Participants' Statement which is attached to Mr. Walker's written testimony. We recommend that $2M be provided to the NRC to provide a basis for adequate licensing review and the issuance of a licensability statement.

A utility contemplating the purchase of a nuclear plant with a projected lifetime of forty to sixty years will want assurance of an affordable fuel supply over that span of time. The Liquid Metal Reactor (LMR) has been chosen throughout the world as the best way to breed plutonium. The unique features of the DOE Modular LMR concept currently under development, for example the SAFR Design, involve a coolant which is not under pressure so that the primary coolant boundary is not highly stressed. The probability of leaks and loss of coolant acidents are minimized. Natural circulation is readily achievable in liquid sodium and the large coolant mass leads to desirable slow response to upsets. Thus, the Modular LMR is a strong candidate to meet the objectives of the advanced reactor program while providing a "bridge" to the breeder when this is needed to supply fissile fuel. We recommend that the funding level proposed by the House Subcommittee on Energy Research and Production, chaired by Ms. Lloyd, be retained to maintain momentum on this important program.

The MHTGR and the Modular LMR have different roles within the DOE Advanced Reactor Program, and we recommend that development of both concepts be continued at the funding levels proposed above.

DOE/EPRI COOPERATIVE EFFORT ON LWRs

Combustion Engineering, Inc. agrees with the views expressed by DOE that, in the near term, the best opportunity to restore the nuclear option to the electric utility industry is to build upon proven Light Water Reactor (LWR) technology. In more than twenty-five years of commercial operation, light water reactors have proven themselves to be safe, economic and environmentally acceptable. We are pleased to note the cooperative effort between DOE and EPRI (representing the utility industry) in the development of detailed requirements for future LWRs and certification of designs incorporating these new requirements. This effort is aimed at ensuring that lessons learned during the operation of LWRs are fed back into design requirements and that the resultant design changes will receive the involvement of the Nuclear Regulatory Commission early in the design process with the aim of achieving design certification in an efficient, responsible and expeditious fashion. This cooperative effort between DOE, EPRI, NRC, utilities, reactor vendors and architect engineers represents a unified and cooperative National Program which will be vital in restoring the nuclear option by building on proven LWR technology. Combustion Engineering is totally supportive of this program.

NEED FOR ADVANCED REACTOR PROGRAMS

Looking farther ahead, we see an exciting opportunity to develop reactors which might better meet some of the then existing market niches, both foreign and domestic, in terms of size, utility cash flow, licensing stability and dependence on operator response. These reactors have the important additional value of establishing a greater product mix in the long term when, inevitably, low-cost resources of oil and uranium are depleted.

It is my opinion that protecting our national energy interests is paramount. We need to extend nuclear power applications to process heat, the transportation industry and other high energy consumption industrial sectors, and we must provide for an adequacy of nuclear fuel in the long term.

Our influence on international markets will only occur if the U.S. nuclear option is restored. Extensive foreign collaboration under terms of a weak U.S. advanced reactor posture could lead to eventual dominance of foreign suppliers within the U.S. We need to evaluate the advantages of foreign technology adoption in the short term versus the everlasting long term impact of U.S. market dependence on foreign suppliers. Do we wish to mortgage our future because of inadequate Federal support now for advanced concepts?

The mission of the Department of Energy is to ensure a stable and secure energy supply for the United States. Their contribution is especially important when considering long term trends which the private sector finds difficult to handle.

It is not popular to talk about shortages of uranium and oil at a time when the miners are strongly encouraging DOE to force the use of domestic ore and OPEC is engaged in a price war against non-OPEC producers, yet history has demonstrated that such matters will not impact long term trends. Policy-makers must look far ahead if they are to take the essential steps now to avert the problems which can be foreseen with great certainty. It is simply not possible to just wait until oil or uranium prices have "gone through the roof" and then immediately build, say 100 GWe of HTGR capacity by Congressional fiat. The technology, the manufacturing capacity, the operating experience, the regulatory structure, and the public acceptance must be painstakingly built up in an orderly manner and the time to begin is now.

The development of advanced reactors is not something that can be handled by private enterprise alone. The development costs are large (although not unprecedented) as are the risks. Development schedules are protracted. In addition, there are institutional problems far beyond the control of the private sector: the NRC, state utility regulators, vocal and effective anti-nuclear activists and an adversarial press. These obstacles, especially for new concepts, impose major incentive restrictions on the reactor suppliers.

It is thus incumbent upon DOE, with the mission of assuring the Nation's energy supply and security over the long term, to sponsor most of the necessary development costs through the demonstration stage, including the issuance of a standard design certificate from NRC. The effort will go for nought unless it can compete in terms of some combination of cost, size, construction time, or special characteristics with the alternatives available in the late 1990's.

Some demonstration plants are necessary if private sector commitments for later commercialization are to be made. Such private sector commitments would be expected to increase as risks are reduced through design, licensing, construction and operation. However, DOE must be willing to accept a major share of the financial risk of an advanced reactor demonstration plant. In addition, support by the utility industry is required. The principal purpose of demonstration plants will be to confirm the performance, reliability, cost and construction schedule for advanced reactor concepts.

CHARACTERISTICS OF ADVANCED REACTORS

Because of the importance of achieving licensing stability and reducing the costs associated with meeting licensing requirements, there is a strong incentive to develop designs which rely on inherent physical properties for safety and protection of the plant. Such designs would have safety features which are simpler, less expensive and more obvious in their operation than the engineered safety systems and multiple redundant support systems which characterize current reactors. The need for rapid, accurate response by skilled operators would be minimized.

The ability to demonstrate the safe behavior of the system under a variety of extreme design basis conditions, such as loss of all power without any operator actions, would help to restore public confidence in the safety and acceptability of nuclear power.

Costs would be reduced by fabricating most of the safety-related equipment in the factory under quality controlled conditions allowing most of the field work to be done relatively quickly and inexpensively by conventional commercial methods.

SMALL LWR

The Small LWR builds directly on the large base of design, manufacturing, and operating experience from the conventional LWRs. In one concept with suitable choice of core design parameters, including power density, the system could respond to changes in power demand without control rod motion or changes in boric acid concentration. If the design power is limited to a few hundred megawatts, the steam generators could be placed inside a reactor vessel of conventional diameter, and natural circulation could be used in place of pumps to transfer heat. The pressurizer could be replaced by a steam bubble in the head of the vessel so there are no large-size primary coolant pipes to install in the field and no pipe-break accidents to consider.

Boiling of the large inventory of water in the vessel could cool the core for over an hour even if all heat removal with the steam generators is lost. This concept thus meets the objectives of inherent, passive, demonstrable safety outlined previously. The elimination of many expensive parts (pumps, pressurizer and pipes) and of most safety-related features external to the reactor vessel results in competitive costs. Because of its reliance on proven LWR components and technology, the Small LWR can be deployed quickly with minimum development costs and risks.

MODULAR HTGR

The MHTGR has unique characteristics which are particularly useful in achieving the objectives of the advanced reactor program. The fuel is able to withstand high temperature (2900°F) during an accident without damage and without releasing radioactivity. Fission products are retained in the fuel under all conditions with almost none released to the coolant or the reactor building. Because of the large amount of graphite in the core, the heat capacity is exceptionally large. This means that many hours are available for remedial action in the event of an upset.

This is the only one of the advanced concepts which can withstand a total loss of coolant. All the decay heat can be dissipated by radiation and conduction to the reactor vessel and from there to the air-cooling system of the reactor enclosure. The coolant, helium, is a non-corrosive gas avoiding concerns for corrosion and the complications of possible phase changes which are associated with liquid coolants.

Another important attribute of the MHTGR is that its high temperature capability makes it uniquely suited for applications other than electricity generation. Since only one-third of the Nation's primary energy requirements are for the generation of electricity, there is a large market here currently served by oil and gas for the most part. Inevitably, these non-renewable resources will be depleted and prices will rise. At that time the availability of the MHTGR may be extremely important to the Nation's economy.

The DOE program has been reoriented toward the objectives described above (a reorientation due in no small measure to the foresighted prodding of this Committee) via the selection of the prismatic fuel, annular core design. The THTR in West Germany is now operating. Continued successful operation of this 300 MWe power plant will give that country a significant advantage in any international competition for HTGR business and could lead to the direct supply of Germany HTGRs to the U.S.

With respect to the near-term development of the MHTGR, we believe a demonstration plant is necessary to focus the design and development effort, to confirm the performance, cost estimates and schedule, and to establish licensing requirements by assisting in securing a Standard License from NRC.

It will be very difficult for the private sector to finance such a program without significant commitments from DOE.

For FY 1987 in particular, the objective has to be to obtain an initial statement of licensability from the NRC. Both NRC and DOE need to be adequately funded for this purpose.

Once a demonstration plant has been built and operated successfully, we have no concern over the commercial applicability of the MHTGR. The Joint Statement of Support attests to the interest of potential customers for this concept.

MODULAR LMR

The Modular LMR builds on a broad technical base of world-wide experience dating back to the EBR-1, the first nuclear reactor to generate electricity for commercial application. The LMR has been chosen throughout the world as the best way to breed plutonium from non-fissile uranium, something that will eventually become very important to do.

A suitably designed LMR meets the U.S. objectives previously discussed. Unique features are that the coolant is not under pressure so that the primary coolant boundary (i.e., the reactor vessel) is not highly stressed. This minimizes the probability of leaks and loss of coolant accidents. In addition, natural circulation is readily achievable in liquid sodium and provides good self-cooling properties for the reactor. The large mass of coolant in the vessel provides large heat capacity, leading to desirable slow response to upsets. For these reasons, among others, the Modular LMR is a strong candidate to meet the near-term objectives of the advanced reactor program while serving as a "bridge" to the breeder when this is needed to supply fissile fuel. As with the HTGR, a demonstration plant will be needed to demonstrate the desirable features.

Mr. Chairman, I would like to thank you and other members of your Subcommittee for the opportunity to comment on these DOE programs.

Mr. BEVILL. Thank you for your fine statement.
Any questions?
Thank you very much, sir.

WEDNESDAY, APRIL 9, 1986.

SOLAR R&D

WITNESS

SCOTT SKLAR, DIRECTOR OF GOVERNMENT RELATIONS, SOLAR ENERGY INDUSTRIES ASSOCIATION

Mr. BEVILL. Mr. Scott Sklar.

Mr. SKLAR. I would like to thank the committee for the opportunity to testify.

I represent a 12-year-old trade association for the solar thermal and photovoltaics manufacturers and component suppliers. The technologies we are addressing are the solar heating and cooling industry, to heat space, and hot water.

Photovoltaics converts sunlight directly to electricity, and high temperature thermal or solar thermal power to convert sunlight to heat for industrial process heat or to create steam to generate electricity.

I have four very brief points to make to you. Our budgets over the last six years were 20 percent of what we were. Our industry has some concerns that if the budget goes below the fiscal year 1986 levels, there is some question as to whether you should continue the program.

We think we have had some very good successes out of this program to get us into the marketplace. We are a small business industry less than 10 years old in reality.

On the heating and cooling side, the DOE program has lowered our production costs and has created some confidence in the technology that in the last two years we are in major retail chains like Sears & Roebuck and Wannemakers and Burdines in Florida, and Woodward & Lothrop in this area, and it is a direct result of the DOE program in photovoltaics we have maintained our lead internationally.

Technologically, though, our lead in the world markets has been cut from 80 percent four years ago to 50 percent this year, directly because of Japanese competition. They subsidize their industry in R&D far more than we do ours. We think we can maintain our lead if we have just maintenance of support, not increased support, in the DOE program.

You may want to know that in 1985 the Japanese surpassed us for the first time in photovoltaic module production, which shocked our industry.

In solar thermal power, Secretary of Energy Herrington will be dedicating solar thermal power, a trough plant, in California this April. This trough technology is directly out of the DOE program again in supporting this. This is all privately financed, this California project. We have made some leads because of the program, small as it is.

We have one problem with the program that our industry and the passive solar industry had asked the committee last year. We have had some trouble in transferring some of the research at the labs to the small businesses. We are not a usual industry composed of a lot of big businesses. We are a lot of small businesses.

We have made some suggestions we thought would be useful to transfer the technology from the labs. Somehow, it didn't get through the committee. If you have some ideas to help us do that, we take your suggestions. But we would appreciate maybe some discussion on that.

On accountability, we have two suggestions to make. The Solar Energy Research Institute in Colorado is the premier solar lab. DOE, in its wisdom, and due to some cuts in funding, has pulled a lot of the research out of the other Federal labs and concentrated them at SERI. We would like SERI to be a discrete line item, and the problem right now is SERI is funded rather circuitously through tithing of individual line items to make their budget.

We feel let's come clean. It is our lead research facility. Let's figure out a way to give them their discrete line item.

Our industry has some concerns that there are some other what we call taxing—it is not the correct terminology—of specific line items within DOE to go to management and accounting goals. And somehow we never know how much actually gets to the program. I know that this committee does watch that a bit and has been promised by the agency that our programs don't get taxed any more than anybody else. But we are a little program and we don't think that is quite true.

If there are some kinds of safeguards we would have no problem if another line item was set aside for accounting and management goals of DOE within the solar program. At least we know exactly how much goes to those efforts. It just would be a little easier for us.

The other two points I would like to make are, one, there has been a process called CORECT, which is an interagency board that was created two years ago to set out an international agenda essentially to promote renewal energy exports across the board so we can compete. They have been divided into subcommittees.

The Energy Secretary, Hodel and then Herrington follows, is the lead of the committee. They have met. Just having a coordination among the Federal agencies to promote a small industry has been great. We think your committee has been supporting that. We appreciate it. It needs to be continued.

Renewables, and particularly in terms of photovoltaics, has great application. There is a very large multi-billion dollar potential market in photovoltaics internationally. The U.S. has the technological lead. If we play our cards right—and that does not mean spending more money just maintaining what we have—we will be in a very, very lucrative market and high technology market that came out of our space program.

Finally, there are some information programs that are a very low cost within DOE. Basically, technical assistance, consumer referral that have been helpful to us—again, being a very small industry, we don't have the kind of resources to do what some of the

larger ones do. If it is continued for a few more years, I think the industry will be large enough to do that.

My basic message is thank you for your support, but we are at a level, I think, where if it gets too much lower, I am not sure it is cost-effective for the Government to get involved any more.

Thank you.

[The statement of Mr. Sklar follows:]

SOLAR ENERGY INDUSTRIES ASSOCIATION Suite 503 1717 Massachusetts Avenue, N.W. Washington, D.C. 20036 (202) 483-6225

TESTIMONY

by

SCOTT SKLAR

DIRECTOR OF GOVERNMENT RELATIONS

SOLAR ENERGY INDUSTRIES ASSOCIATION

before the

Subcommittee on Energy and Water Development
House Appropriations Committee

APRIL 9, 1986

WASHINGTON, D.C.

INTRODUCTION

Mr. Chairman, I would like to thank you and the Committee for allowing the Solar Energy Industries Association (SEIA), the national trade association for the solar thermal and photovoltaics manufacturers and component suppliers, to testify regarding the U.S. Department of Energy's solar research and development budget for FY'86 and FY'87. I will present a very brief overview and the representatives of our association's three technical Divisions--Solar Heating & Cooling, Solar Thermal Power, and Photovoltaics--will also present some testimony later today. I will be happy to answer any questions regarding the specifics of these programs either orally or in writing.

SOLAR ENERGY BUDGET

The Solar Energy Industries Association, when speaking on the U.S. Department of Energy's solar research and development budget, is focusing on the parts of that budget which assist the solar thermal and photovoltaic industries, as well as the international and information programs including support for the federal laboratories, specifically the Solar Energy Research Institute (SERI). SEIA has calculated that these specific programs which accounted to more than $150 million in FY'83 now accounts for $75 million in expenditures. Although the solar industry is sensitive to the deficit, we must point out that the solar budget has been drastically cut over the last five years to such an extent that further cuts would totally undercut the federal effort. At some point further cuts will invalidate the U.S. solar program. Making large cuts in the solar and renewables budget while cutting the larger nuclear budget slightly is both inequitable and shortsighted. SEIA's Division representatives will testify on the priorities in each program so that this subcommittee can make sound judgements on the priorities of these programs. Though we accept that everyone must share budget cuts, SEIA urges you to hold fast against precipitous cuts of this program.

PROGRAM ACCOUNTABILITY

The Solar Energy Industries Association is concerned that the administrative, accounting, and program practises as currently done, do not provide for responsible oversight of the solar and renewables programs within the U.S. Department of Energy. SEIA would like to propose two recommendations to the Congressional authorization and appropriations committees that would make accountability and oversight easier in regard to these programs:

- o set-aside monies in a line items to meet administrative and management requirements;
- o place the Solar Energy Research Institute in its own line-item.

Currently, the solar industry, and we believe the U.S. Congress, is not fully aware of the actual appropriations in our programs. That is because the U.S. Department of Energy has a series of internal administrative and management programs where line items are "taxed" across the board. In our opinion, not only ate the different line items "taxed" at different rates but at different times. Contrary to agency assurances, the solar programs are not treated in the same way as the larger conventional energy programs. Even if treatment was equitable, the fact that the solar programs are so small makes the "taxing" a real deterrent to planning.A set aside for the myriad of agency requirements will then provide the agency and the Congress with the assurance that the money appropriated will actually go towards the programs funded.

In addition, the funding of the nation's premier research facility, SERI, is accomplished through a practise of forced tithing at each program level. Although the tithing has generally worked, the fact is that SERI ought to be funded openly. This provides greater stability for SERI and provides the U.S. Congress and the solar industry an upfront view of how the program research pie is divided. SEIA urges the Committee to support SERI at current levels in a separate line item function.

SOLAR PROGRAM HELPING THE INDUSTRY

Several programs are included in the U.S. Department of Energy's solar reasearch and development program that has helped the industry and should be continued. The international program has supported the CORECT process, a federally mandated interagency coordinating group to promote a more cooperative national approach fostering the export of solar and renewable energy products. The international program also contributes through the U.S. Department of Commerce towards international trade shows which are cost-shared with the U.S. solar industry. These programs have been effective and deserve continued support.

The DOE federally supported technical service, called the Natioanl Appropriate Technology Assistance Service (NATAS) has been very useful through its toll free phones and its computer data base to refer individuals and companies to the appropriate industry sectors, as well as by assisting people with technical problems that are beyond the scope of the hundreds of small businesses that comprise the solar industry. The program needs to be expanded to transfer the useful information into a more active approach to help the U.S. solar industry and the Congress should continue their support of this cost-effective program.

Finally, the DOE conservation program monies that involve research and application ought to be merged with the current DOE solar buildings program which has been very effective in integrating design and active & passive solar applications into an integrated package of energy savings. Conservation is a component of this, and these programs have been separated far too long due to agency and constituency politics. SEIA also urges that the Committees include clear legislative language which directs the Department of Energy to carry out programs which effectively transfer the results of federal research to the industry. An attempt by SEIA to have funds set aside for this purpose was not followed through by the Congress for FY'86 and we urge you to support technology transfer in FY'87.

CONCLUSION

The U.S. Department of Energy solar research and development budget has been an extremely useful program to aide the fledgling solar industry to enter the market place. However the program to continue to be effective is funded at its lowest base level currently. Certain accounting and appropriations practises will make the solar budget easier to administer and oversee. The international and NATAS programs have been effective and should be continued. Federal research needs to be more effectively transfered to the solar industry and the nation's solar research facility needs continued level support. Consolidating certain conservation and solar buildings programs make sense with decreasing revenues.

Attached is my testimony on the solar heating & cooling R&D budget which I presented before the Subcommittee on Energy Development and Applications of the House Science and Technology Committee on February 27, 1986 which will supplement this testimony. Representatives from SEIA's Solar Thermal Power and Photovoltaics Divisions will present their own testimony later today. Thank you.

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TESTIMONY

by

SCOTT SKLAR

DIRECTOR OF GOVERNMENT
RELATIONS

representing

SEIA's HEATING & COOLING DIVISION

before the

Subcommittee on Energy Development and
Applications of the House Science and
Technology Committee

February 27, 1986

Washington, D.C.

Joe Conrad, Chairman
(The Amcor Group Ltd)
Dick Joyce, Vice Chairman
(Morning Star Manufacturing Inc.)
SEIA Heating & Cooling Division

1.0 Introduction

The technology for the collection of sunlight for water and space heating has been available in the marketplace since the 1973 oil boycott with over 85 percent of the low and medium temperature solar manufacturers in business since 1978. Over the last eight years the environment for solar, in terms of government support, has neither been fair or consistant. The solar buildings and energy systems program was cut 45% from FY'84 to FY'85. This small $8 million program that benefits the active and passive solar industries has provided some very positive results for the solar energy industry which is comprised totally of small businesses. With $1.9 million going towards Congressionally directed projects, an even smaller amount eventually gets to industry-oriented programs.

2.0 Solar heating & cooling

Solar heating and cooling provide the most efficient means to heat water and space for low-temperature applications in homes and commercial buildings. The United Stater should not waste our other precious finite fuels on uses that are more efficiently accomplished by solar energy.

2.1 Federal program by the U.S. Department of Energy

The U.S. Department of Energy's solar buildings program has benefitted the solar industry in many ways including:

- o Research in the use of thin films or foils in collector construction, which has the potential to reduce collector installed costs substantially;
- o Research into substitution materials and high performance materials to increase both active & passive solar output;
- o Research into integrated systems incorporating conservation materials and active/passive solar applications to improve overall energy savings.

In order for this young industry to become fully viable in the marketplace, the U.S. Department of Energy research program must be continued at the minimal level. Since this solar budget has been cut more than any other renewable energy line-item, SEIA hopes the Committee will maintain level funding and support its goals.

2.3 Potentials for the solar buildings program

Several programs are in process that will have positive benefits for the solar energy industry and the American consumer including:

- o Development of a national design and installation manual;
- o Technology dissemination to the solar industry from research programs at the national laboratories;
- o Facilitation program through CORECT to assist the industry in developing new export markets such as Caribbean basin.

2.4 Conclusions

The solar industry is a small business industry is unable to conduct the kind of research necessary to integrate their products with other energy conserving products to achieve maximum effectiveness. The consumer tax incentives have not been extended and the industry is in a tenuous situation. Loss in federal R&D support would hurt even more. During the last two years, the solar hot water industry has been able to sell its products through major retail chains such as Sears & Roebuck, Woodward & Lothrup, Wanamakers, and Burdines. This represents a major step in the maturing of the solar industry. The DOE solar buildings budget has been cut far more than other programs and must be maintained at near-to-current levels.

Mr. BEVILL. Thank you very much.
Any questions?
Thank you, sir. We appreciate your fine testimony.

WEDNESDAY, APRIL 9, 1986.

ENERGY RESEARCH

WITNESSES

JEROLD ROSCHWALB, DIRECTOR OF GOVERNMENT RELATIONS, NATIONAL ASSOCIATION OF STATE UNIVERSITIES AND LAND GRANT COLLEGES

WILLIAM KERR, DIRECTOR, OFFICE OF ENERGY RESEARCH, UNIVERSITY OF MICHIGAN

Mr. BEVILL. Mr. Roschwalb.

We are pleased to have you with us, Mr. Roschwalb. You may proceed as you wish.

Mr. ROSCHWALB. Thank you.

Mr. Chairman, I am here today to do two things, really. The first is to indicate that the brief testimony about to be presented is in behalf not only of the National Association of State Universities and Land Grant Colleges, for which I work, but also the Association of American Universities, the Council of Graduate Schools, the American Society of Engineering Education, and the National Society of Professional Engineers. Together, they make up a bonus of concern and institutions that represent the interest that we are going to present.

The second task, given the expertise within our organization we asked for an expert to present testimony to you. He is Dr. William Kerr, the Director of the Office of Energy Research at the University of Michigan. He will present the testimony.

Mr. BEVILL. Dr. Kerr, we will be pleased to hear from you.

Mr. KERR. Mr. Chairman, distinguished members of the committee, I am Professor William Kerr, Director of the Office of Energy Research at the University of Michigan. I come to you this afternoon with a request for support of nuclear engineering education and research throughout the United States. However, much of what I say could be applied to engineering education generally.

Let me comment at the outset that all of us making this request are aware of the budget stringencies that face all programs which depend on Federal support. Universities are, I think, unusually aware of budget stringencies these days. It is our view, however, that nuclear energy and the need for highly trained professionals who will develop and control its application are unique.

Because of the role that nuclear energy has in both civilian and the military sectors, and because of the unprecedented Federal responsibility for its development and control, we believe that the Federal Government has a special responsibility to ensure a continuing pool of trained people is available to ensure this unique source of energy is managed safely and effectively.

In the civilian sector, there is a hiatus in new plant orders in this country, although at present we have about 100 plants in oper-

ation and another 30 plants under construction. However, in France, which currently generates about 70 percent of its electricity from nuclear power, in Japan, in the Federal Republic of Germany, and in the USSR, there are well-planned, long-range programs for further development of nuclear energy as a source of electric power generation.

Many small countries—South Korea and Taiwan are examples—are also moving to generate significant fractions of their electricity with nuclear plants.

Prudent management of our natural resources dictates that we be in a position to continue the development of uranium as a source of fuel.

Western nations in the Third World, as well, will require increasing resources of energy as populations grow and as appetites for industrial development are whetted.

All of us recognize that the supply of fossil fuels is limited. Furthermore, the worldwide concern with industrial pollution makes it imperative that energy sources such as uranium, the use of which has a benign effect on the environment, be developed where practicable.

On the international front, if we are to have any significant influence in controlling the ever-present threat of weapons proliferation, we must maintain a high level of capability in nuclear technology, including nuclear power development, both fission and fusion—fission for now, fusion for the future—and we must continue to share with other countries in a way which will discourage further weapons development.

Universities are the only source of highly trained people who will be required to fulfill these responsibilities. However, the nuclear engineering programs in this country are being hard-pressed to maintain the research and development activities that are required for the training of nuclear engineers and scientists.

Research is an indispensable part of the education that will produce the people that the national interest demands. This requires fellowships, especially for those who are beginning graduate work, support of research and support of research reactors that are an integral part of much of the nuclear research program.

Partly because many of the organizations that traditionally provide support for graduate education and research regard nuclear engineering as a special responsibility of the Department of Energy, nuclear engineering departments find it increasingly difficult to supply the required funding.

We suggest a level of annual support of $6.25 million to come from the existing Department of Energy research budget and to be dispersed nationwide on a competitive basis. This can make a significant positive contribution.

We ask that you give serious consideration to this urgent national need.

Thank you for this opportunity to appear before you.

[The statement of Mr. Kerr and attachment follow:]

TESTIMONY

Before

The Subcommittee on Energy & Water Development

House Appropriations Committee

in behalf of

The National Association of State Universities and Land-Grant Colleges

Association of American Universities

Council of Graduate Schools

American Society of Engineering Education

National Society of Professional Engineers

By

Dr. William Kerr

Director of the Office of Energy Research

University of Michigan

April 9, 1986

Mr. Chairman, Distinguished Members of the Committee, I am Professor William Kerr, Director of the Office of Energy Research at the University of Michigan. I am grateful for this opportunity to appear before you.

The specific subject of my remarks this afternoon is the urgent need to revitalize nuclear engineering education in the United States. However, I must stress that nuclear engineering education may serve as an exemplum or metaphor for much of engineering education and especially energy related engineering education in our nation. It has been said that it is easier to attain excellence than maintain it. The United States, in the past half century, achieved a remarkable stature in science and technology. Much of the achievement is traceable to the extraordinary system and network of universities, colleges and institutes that trained our highly creative engineering force. Our concern here today is to urge attention to the nation's capacity for improving education lest neglect create serious problems for the nation's economy and national security. Mr. Chairman, for the record I am submitting a copy of a study completed just three months ago. It was carried out by the Commission on Education for the Engineering Professions of National Association of State Universities and Land-Grant Colleges, and is a study on the "Quality of Engineering Education."

Its findings summarize the central problems that concern us.

1. Shortfall in engineering faculty: graduate enrollment in the past four years, responding to market needs, has increased by 25%; faculty by only 7.2%.

2. Too few of the best BS engineering students go on to graduate study - perhaps due to graduate student stipends that are far too low. (As for research assistants, there is a perceived shortage of 81%; 47% of current RA's are foreign.)

3. The academic engineering environment has seriously deteriorated due to lack of space, obsolescence of equipment and lack of support staff. Frequently, as a result, faculty are not from the top rank of new Ph.D's.

4. Lack of space is most critical. Much current space lacks power and air conditioning for new technologies. And while equipment acquisition has increased significantly, maintenance budgets have not.

By way of background, I would like to cite a few paragraphs from a report on the subject, dated October 1985, by the Nuclear Engineering Department Heads Organization:

The current state of nuclear power in the United States must be viewed as temporary. A growing economy, which is necessary to maintain the United States in a leadership position, requires increased use of electricity. Therefore, new power plants, be they powered by either fossil or nuclear fuel, must be constructed prior to the end of the century to meet this increasing demand, as well as to replace older plants, fossil and nuclear, that are no longer usable.

Because of the potential costs of dealing with environmental consequences of burning fossil fuels - acid rain, strip mining, atmospheric carbon dioxide buildup - the role that coal will fill in satisfying United States energy needs is not clear. The more exotic alternatives, such as fusion and solar, are still decades away from providing substantial portions of energy requirements. Most large rivers have already been harnessed; hydropower cannot be expanded to any significant degree. Although conservation is still a promising option, it has its price and its limits.

Because no one source of energy can be quickly and indefinitely expanded to supply a large percentage of United States energy requirements, it is necessary to maintain an appropriate mix of energy sources to guarantee the ability of the country to supply energy as needed. Nuclear power should be preserved in that mix of energy sources because, in spite of the problems faced by nuclear power, operating nuclear plants are supplying electricity at costs competitive to coal-fired plants and with less environmental impact.

However, if the nuclear power option is to remain open, a work force of nuclear energy professionals must be available. These professionals will be developing the innovative and state of the art technology that will facilitate the economic construction, and reliable, safe operation of nuclear power plants when they are once again ordered. In the meantime, they will be developing new ways to improve the operation and maintenance of existing power plants.

Universities are the only source of the highly trained people who will be required to fulfill these obligations. And yet nuclear engineering programs of the major research universities in this country are being sorely pressed to retain the high quality programs that are needed to supply the engineers and scientists required by government and by industry over the next several decades, if we are to live up to our obligations.

In the mid-1950's, the Atomic Energy Commission began and maintained for a number of years a graduate fellowship program. This program produced a large number of professionals who now provide leadership in the nuclear energy areas for which both government and industry are responsible. Although a very small program is now financed by the Department of Energy, it is far below what is needed to provide for future needs. Related areas of concern are:

- Research is an indispensable component of the educational process and an important source of innovative ideas and creative solutions for nuclear power development. During the last five years, research funds available to nuclear engineering programs at universities have been very small.

- University research reactors have not escaped the nuclear engineering funding flight. Federal funds for reactor operations, upgrade and research continue to be inadequate, threatening the viability of all research reactor facilities.

- An additional problem is obsolescence in engineering laboratory equipment for teaching and research. The shortage of equipment funds for nuclear engineering has created an especially difficult situation.

With the development of improved nuclear power systems and the growing recognition that nuclear power is a viable source of generating electricity, the United States will assuredly once again turn to nuclear power for some of its future energy needs. It is in the national interest that universities receive vigorous support of the Federal Government in the form of fellowships, research support and assistance for university reactors. Additional support in the amount of $6.25M would represent a significant commitment toward the current national nuclear education needs, specifically, to provide:

$1.25M to fund 50 graduate fellowships @ $25,000 each;

$2.5M to fund competitive research and

$2.5M to fund support for research reactor operation and use

QUALITY OF ENGINEERING EDUCATION II

COMMITTEE ON THE QUALITY OF ENGINEERING EDUCATION
COMMISSION ON EDUCATION FOR THE ENGINEERING PROFESSIONS
NATIONAL ASSOCIATION OF STATE UNIVERSITIES AND LAND-GRANT COLLEGES

JANUARY 15, 1986

59-750 O—86——13

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EXECUTIVE SUMMARY

Over three years ago, the Commission on Education for the Engineering Professions of NASULGC issued a report on the Quality of Engineering Education, termed the Kemper Report. The report indicated that there was a crisis in engineering education at that time, caused by overenrollment in undergraduate programs, shortage of engineering faculty, obsolescence of equipment, and lack of space. A NASULGC committee was convened in 1984 to reassess the quality of engineering education and to examine the changes that have taken place in NASULGC engineering schools and colleges since the time of the Kemper Report. Data were obtained from a questionnaire sent to all NASULGC engineering schools, replies were received from 49 schools which enroll approximately two thirds of the total engineering students, both undergraduate and graduate, that are enrolled at NASULGC schools.

After a thorough examination of the data, the committee concluded that there is still a decline taking place in the quality of engineering education caused by overenrollment. Data from the NASULGC survey indicated that, whereas a slight decrease has taken place in undergraduate enrollment, this has been more than compensated for by a 25% increase in MS and PhD enrollments over the period 1980-81 to 1984-85. During the same period, engineering faculty increased by only 7.2%.

The quality of the undergraduate student remains excellent, however, there is an indication that the top BS engineering students are not continuing on to graduate school but are pursuing careers in industry. In order to change this trend, the committee feels that graduate student stipends must be increased to 50% of the starting salaries of BS engineers. Current stipends, with only a few exceptions, fall far short of this.

The academic environment available to engineering faculty is deteriorating due to lack of space, obsolescence of equipment, and lack of support staff. This has brought about a decrease in the desirability of an academic career for new PhD's in engineering so that new faculty do not always come from the top rank of PhD's. University administrations seem especially slow to react to faculty needs for support, such as secretarial and technician staffing and teaching and research assistants. Such support is particularly important in times of overenrollment.

Lack of space remains a most critical problem, little new construction has been completed in NASULGC engineering schools during the past five years. A great deal of current space is unsuitable due to lack of power and air-conditioning required for new technologies. A massive building program must be started, with total cost well over one billion dollars, to provide the necessary space for quality engineering education.

There have been significant increases in equipment acquisitions for NASULGC engineering schools since the time of the Kemper Report, due both to increases in state budgets and industrial donations. However, there has not been a concomitant increase in maintenance budgets. According to the survey, whereas equipment budgets have increased by 265% since 1980-81 and donations have increased by 288% since 1980-81, maintenance budgets have only increased by 75%. It is recommended that tax deductibility be provided for maintenance of donated equipment and that, in the future, state maintenance budgets be compatible with equipment budgets. The increases in equipment budgets are still far from adequate to meet needs; it is recommended that a Federal matching grant program be initiated to bring engineering laboratories, both teaching and research, up to an acceptable level.

INTRODUCTION

In November, 1982, the Commission on Education for the Engineering Professions of NASULGC issued a Report on the Quality of Engineering Education. This report alerted the reader to the "Crisis in Engineering Education" existent at that time. This crisis was caused by the following factors outlined in the report:

1. The increase in undergraduate enrollments since 1975 that has overloaded available resources in engineering schools.

2. The lag between faculty and industrial salaries.

3. Decline in the number of doctoral degrees available for U.S. employment and a resultant shortage of faculty candidates.

4. Obsolescence of equipment available to engineering schools.

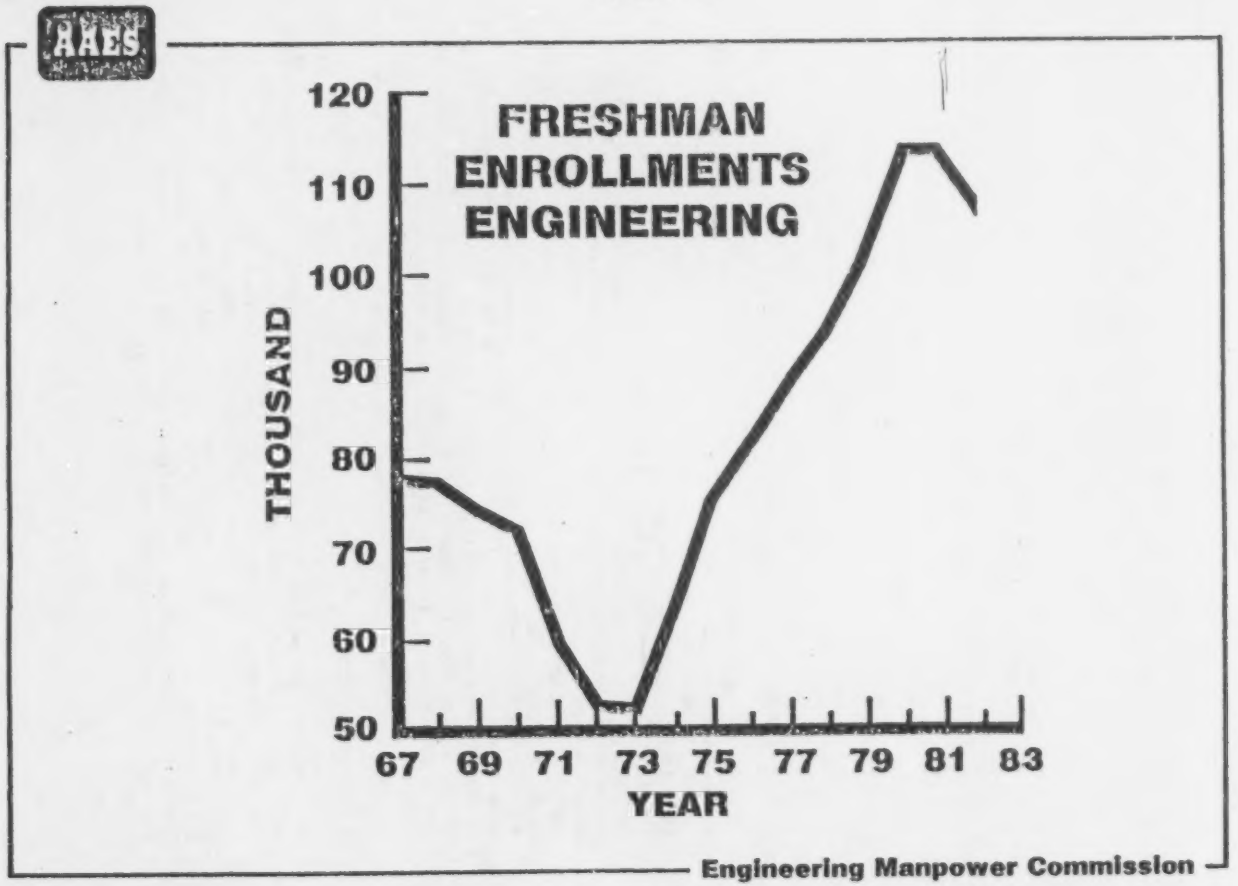
5. Lack of adequate space, especially under the current conditions of high enrollment.

It is important to now reassess the question of the quality of engineering education and to examine the changes that have taken place during the past few years. A committee was convened in 1984 to study this issue for NASULGC engineering schools and colleges. The committee chose to focus on key areas of enrollment trends, quality of students, quality of faculty, space, facilities and laboratories, and support. In order to assist the committee in its deliberations, an extended questionnaire was sent out to all NASULGC schools and colleges of engineering, a copy is provided in the Appendix. Replies were received from 49 engineering colleges, a number which is felt to be representative of NASULGC schools. These schools represent a good cross section including large universities with well over 5000 engineering students, smaller universities with less than 1000 engineering students, engineering colleges with a strong orientation towards research and graduate study as well as those with a prime emphasis on undergraduate education. Data from the questionnaire as well as perceptions of the committee members were used in the preparation of this report.

ENROLLMENT TRENDS

During the period 1973 to 1983, total engineering undergraduate enrollments in the United States doubled, increasing from 200,000 to 400,000. However, an examination of the nationwide data as well as data from the current NASULGC study indicates that total enrollments peaked in the 1982-83 academic year and are now slightly decreasing. For example, data from the 49 schools replying to the questionnaire indicated an 8.3% increase in undergraduate engineering enrollments from 1980-81 to 1982-83, but a 0.24% decrease since then. Likewise, nationwide undergraduate

FIGURE 1.


AAES
FRESHMAN
ENROLLMENTS
ENGINEERING
THOUSAND
120
110
100
90
80
70
60
50
67
69
71
73
75
77
79
81
83
YEAR
Engineering Manpower Commission

engineering enrollments showed a 3.8% decrease from 1982-83 to 1983-84. More data are provided in Figure 1, indicating the drop in nationwide freshman engineering enrollments in the early 1980's.

Master's enrollments in engineering have increased nationally by 39.7% over the period 1980-81 to 1984-85; data from the NASULGC questionnaire showed an increase of over 24.5% over the same period. In both cases, the trend is towards increasing enrollments at the MS level. PhD enrollments have increased nationally by 43.4% over the period 1980-81 to 1984-85; data from the NASULGC questionnaire show an increase of 25.2% over the same period. PhD enrollments are also increasing at a steady rate.

The number of full-time engineering faculty in the NASULGC schools responding to the questionnaire increased by only 7.2% over the period 1980-81 to 1984-85. In other words, the undergraduate student to faculty ratio in NASULGC schools of engineering has changed very little from the time of the Kemper Report of 1982. The graduate student to faculty ratio has increased by 19% over the period 1982-83 to 1984-85, and the trend is towards further increases. In other words, the problem of overloads of the resource base in engineering education, mentioned as part of the Crisis in Engineering Education in the Kemper Report, has been amplified in the years since the appearance of this report. During this time period, many NASULGC schools have adopted plans to limit or manage undergraduate engineering enrollment; further, demographics indicate a decrease over the next few years in the numbers of students in the college age group. Both factors taken together have caused the decrease in freshman engineering enrollment noted above. This decrease has not been even larger due to several factors: budgets of NASULGC engineering colleges are, in many cases, tied to the numbers of engineering students so there is a strong desire not to drastically reduce student numbers; the job market for engineers remains relatively good, so there is a strong desire for students to pursue an engineering degree; state engineering schools provide engineering talent for the states' "high tech" and other industries which enrich the states' economy, there is therefore political pressure not to reduce engineering enrollments. It becomes apparent, then, that over the next few years, undergraduate engineering enrollments will decline to some extent, but the increase in graduate enrollments will compensate for this. In the following, we will look at the quality of engineering students entering and try to get some idea of the "value added" in the engineering schools, the quality of faculty and the intellectual environment in which they are immersed in the current situation of overcrowding, and the quality and quantity of space, facilities, laboratories and support which are all so vital for a quality engineering education.

QUALITY OF STUDENTS

One method of measuring the quality of engineering education is to examine and compare the quality of entering and graduating students, year by year. SAT scores of entering engineering freshmen from the schools

responding to the survey averaged 1124 for 1984-85, up only slightly from 1114 in 1983-84 and 1110 in 1982-83. These values typically rank as the highest for the students of any school or college on campus. The average time to obtain an engineering degree from those schools on the semester system is currently 9.3 semesters; 14.1 quarters for those on the quarter system. These values have not changed appreciably over the past five years for the schools responding to the survey. Success rate from the EIT exam averaged 84%, about the same as that of five years ago. 87% of those responding reported the imposition of some type of enrollment management, established on relative standing, numerical ceilings or GPA criteria. Controlled entrance, or limitation on engineering enrollment, was felt necessary to combat the ever increasing enrollment and overcrowding of engineering schools.

The above methods used to quantify the quality of engineering students and engineering education are imperfect, at best. Qualitatively, a majority of university placement directors and corporate interviewers firmly believe that, in spite of the erosion caused by overenrollment and resource imbalance in engineering schools, engineering graduates today are better prepared than ever. It is true that engineering education, on the average, has adapted well to the use of new technology such as computer technology. In fact, the exposure to the computer that an engineering student receives in engineering schools exceeds the exposure he will receive at many companies when he starts his career. This fact alone is undoubtedly impressive to a recruiter. However, it is as yet too early to judge the ability of today's engineering student and graduate to be creative, to design imaginatively, to make assumptions and judgments relative to engineering situations. Traditionally, these latter abilities have been developed in small classes with groups of students working on "open-ended" or design projects with faculty acting as advisors or consultants. Such situations are faculty intensive and are therefore impossible under the current case of overenrollment. Further, whereas the use of computers in engineering curricula has greatly increased over the past five years, the experience of students in engineering laboratories has not kept pace. The number of experimental laboratories in engineering programs has decreased; the purchase of new equipment (other than computers) has not kept up with the growth in enrollments, and the updating of old equipment and instrumentation that has been in use for too long has not, in general, taken place. As a result, today's engineering students in many cases lack the type of hands-on experience that is an essential part of a quality engineering education.

A particularly difficult problem exists in Electrical and Computer Engineering Departments due to the current and projected popularity of this field, as shown in Table 2.

TABLE 1

	80-81	81-82	82-83	83-84	84-85
% Faculty in ECE	24.0	24.0	24.7	25.1	26.0
% Students in ECE	27.0	27.5	28.8	31.2	32.9

In other words student enrollments in ECE have increased by 21.9% during a time period in which faculty in ECE increased by only 8.3%. Many schools are making an effort to align resources with student enrollments, but there are difficulties in reallocating faculty positions and resources within a college of engineering and still maintaining the viability of the other engineering programs.

Responses to the survey indicated an increase in GRE scores, as shown in Table 2, and that 42% of the engineering graduate students are foreign, about the same value as that of five years ago. There thus appears to be an improvement in the quality of graduate students, yet further data from the study indicates that the average GPA of entering graduate students was only 3.26. In other words, many of the top undergraduate engineering students are foregoing graduate study, presumably because of the very attractive salary offers available to graduating seniors.

TABLE 2

	80-81	81-82	82-83	83-84	84-85
GRE Scores of New Graduate Students	1134	1159	1142	1166	1189

QUALITY OF FACULTY

Of key importance to the quality of engineering education is the quality of the faculty. In spite of the very high enrollments in engineering schools, faculty must still stay abreast of the rapidly changing technology, be aware of what is occurring in industry and impart this information to the students.

In the schools surveyed, 92% of the faculty have PhD's, the average full-time industrial experience is 3.1 years per faculty member, 47% had research grants within the past year, 63% were actively involved in consulting and 61% used the computer in instruction. On the average, only 5% of the lecture courses in NASULGC engineering schools were taught by graduate assistants, whereas within supporting departments such as math and physics over 17% of the lecture courses were taught by graduate assistants. In other words, in spite of the large class sizes, engineering schools continue to maintain their lead over other disciplines in stressing the importance of the professor in the classroom. The values quoted above are impressive and speak highly of the quality of engineering faculty. The turnover in engineering faculty is relatively small; of the schools surveyed, on the average, during the past two years, 3.3 faculty left for employment in industry, 3.5 left for employment in other universities. Salary levels for starting PhD's in engineering schools now appear to be competitive with industry, especially when summer compensation is fully taken into account. There is, however, a growing salary compression problem especially at the senior levels.

The major concern, however, is not with salaries but rather with the general environment for intellectual growth and development of faculty. Both students and faculty alike suffer from a major impact in this area. Engineering is a professional school with general education and professional education compressed into the shortest period of any profession. It is remarkable that buildings stand, bridges last, aircraft are the most reliable in the world, manufacturing competes, and technological development continues largely on the backs and intellect of BS engineers. However, the situation has worked well to date. Now we face a real and present danger of major proportions. The most outstanding PhD's are not being attracted to careers in Engineering Education. The reason is a complex matrix of issues including the responsibility for raising ever growing magnitudes of research funds in order to support the intellectual property development; the university environment that fails to respond to the needs of engineering faculty and demands that engineering overhead support other endeavors; the lack of recognition that engineering is a professional school and should be as highly regarded as law and medicine; the shortage of engineering equipment and appropriate space for labs and research.

Virtually all new engineering faculty members have PhD's, the PhD is essentially a research degree. In order to attract the most outstanding PhD's to academia, the proper environment for research must be available (as it would be in an industrial research lab which is competing for the PhD). It is impossible to pursue one's research with inadequate space, outmoded equipment, and lack of technical support. At the same time, a new faculty member must teach large classes, grade papers, and advise large numbers of students. The combination drives many top PhD's towards industry and away from the university.

The immediate corrections needed are increased numbers of faculty to handle the undergraduate load and increased support of this broad-based faculty professional to provide an attractive quality of academic life.

The erosion of the atmosphere for engineering academicians has occurred gradually over the past few years; it is affecting the quality of faculty and, consequently, the quality of engineering education. Needless to say, as retirements occur in the future, this problem will become even more serious.

SPACE, FACILITIES AND LABORATORIES

Appropriate space, facilities and laboratories are essential to a quality engineering education. In fact, shortages and limitations in these resources have been chief reasons for the decline in engineering education that has occurred over the past five to ten years.

From results of the survey, the average college of engineering utilized the following space:

TABLE 3

Current Space Utilization by the
Average College of Engineering

	Space (K Sq.Ft.)	Space per UG FTE (Sq. Ft.)	Space per Faculty FTE (Sq. Ft.)
Instructional Labs	60.2	31	601
Research Labs	87.9	36	703
Faculty Offices	33.7	14	290
Graduate Offices	15.3	5	120
Shops	12.0	6	129
Administration	14.4	6	124
Other	27.7	12	253
Total	251.2	110	2,220

One can raise the question: "How much construction would be required to raise those colleges currently below the level of 2,220 sq. ft. per faculty to that level". For the 49 reporting colleges, the required construction would be 1.9 million sq. ft. Assuming a nominal cost of $125 per sq. ft. that implies a cost of $238 million. Further, if that value is extrapolated to 250 colleges of engineering, the required capital would be approximately $1.2 billion. That is, about $1.2 billion would be required to bring all the nation's colleges of engineering to today's average space allocation -- and this itself is certainly below the desirable target when considering the enrollment increases of the past years, undergraduate and graduate.

The 49 responding colleges reported the following construction activity during the 1980's:

TABLE 4

New Construction and Renovation
(Totals for all responding colleges)

During 1980-84	
New	479 K Sq. Ft.
Renovation	666
Current Construction	
New	1,209
Renovation	347
In Planning	
New	2,215
Renovation	1,165

It is interesting that, in the years of very high enrollment 1980-84, only two schools out of 49 reported new coupleted construction of buildings greater than 100,000 sq. ft.; two more with buildings of size between 50,000 sq. ft. and 100,000 sq. ft. Lack of space looms as an extremely large problem, if not the largest roadblock in the path of quality engineering education.

Class section sizes also reflect the burgeoning enrollments which were encountered during the early 1980's. Most of the average section sizes shown below are simply not acceptable to engineering educators who must teach a technically oriented, design intensive discipline.

TABLE 5

Class Section Sizes for the
Average College of Engineering

	Lecture		Laboratory	
	Average	Maximum	Average	Maximum
Freshman	84	158	25	30
Sophomore	63	134	23	34
Junior	46	132	21	39
Senior	36	99	19	36
Graduate	13	36	9	17

The average number of students per laboratory station has risen only slightly from 4.14 in 1980-81 to 4.25 in 1984-85. Nevertheless, it must be noted that four students per station is not pedagogically acceptable. Many engineering faculty feel that laboratory experiments should be performed by no more than two students jointly. Over this same period the average number of required laboratories and the average number of elective laboratories have remained relatively constant. Tables 6 and 7 present equipment funding figures for the period of 1980-85. Table 6 shows the amounts available to the average college of engineering, and Table 7 shows the average amounts available per undergraduate FTE.

TABLE 6
Equipment Funding for the
Average College of Engineering
($K)

	80-81	81-82	82-83	83-84	84-85	Total Increase
Institutional Equip. Engr. Budget	293	406	389	560	1,070	265%
Maintenance Budget	127	140	176	193	221	75%
Donations	153	235	295	826	594	288%
Total Spent on Equipment	529	678	747	1,298	1,748	230%

TABLE 7

Equipment Funding per Undergraduate FTE
($ per FTE)

	80-81	81-82	82-83	83-84	84-85	Total Increase
Institutional Equip. Engr. Budget	159	181	195	208	449	182%
Maintenance Budget	80	80	90	100	130	63%
Donations	109	143	192	493	344	216%
Total Spent on Equipment	256	287	339	601	901	252%

These dramatically increasing figures reflect the significant effort that has been made to overcome the enormous equipment problem facing colleges of engineering. This problem has resulted from a combination of: periods of equipment under funding, dramatically increased enrollments, increasingly rapid obsolescence of equipment, and the necessity of keeping abreast of new computer technology.

Two particular factors should be noted, however. First, maintenance funds are not increasing in proportion to new equipment acquisitions. This implies that a major maintenance problem looms ahead. And, second, on a more positive note, it is encouraging that donations (primarily industrial) show the largest increase. This would seem to imply both that industry recognizes the dilemma that colleges of engineering are facing and that they are more supportive of our programs than governmental funding agencies and university administrations.

Unfortunately, donations of equipment seldom include provision for maintenance; maintenance costs for computer and other equipment often average 10 to 12% per year of the purchase price. There are many instances in which schools must reject gifts of badly needed equipment due to a lack of ability to handle maintenance costs of the gift.

SUPPORT

In this section, we will consider the quality of services provided by NASULGC universities in support of engineering education. Such support is necessary not only for directly aiding the faculty and students in the classroom and laboratory but also for providing the proper academic environment in which faculty can pursue research, and keep abreast of their field.

Graduate teaching assistants can be valuable resources to faculty in grading papers, holding tutorial sessions, and teaching and helping in laboratories. In current times of high enrollments, TA's became especially important to faculty. In the survey, a question was asked about the current number of TA's in engineering and the number needed to insure a high quality program. Responses indicated a deficiency of 34%. Further, the responses indicated that 41% of the TA's are not U.S. citizens,

leading to potential problems of communication difficulties in the classroom and lab. The situation with graduate research assistants, most of whom are funded by external research contracts, is even more pronounced. Of the schools responding, there is a perceived deficiency of 81% in numbers of RA's and 47% of the current RA's are foreign.

From the survey, the average ratio of state-supported technicians to engineering faculty members is 1 to 8; the average ratio of total technicians (including those on soft money) to engineering faculty members is 1 to 6. Respondents felt that the ratio needed to ensure a high quality program is 1 to 3.5. This could be achieved by increasing the number of state-supported engineering technicians by 95%. It is interesting that this situation is reversed in European schools For example, in the United Kingdom, the ratio of engineering technicians to faculty is 1 to 1; this ratio was as high as 2 to 1 before the budget cutbacks that have occurred over the past few years.

There is a similar situation in secretaries. Results of the survey indicated a ratio of faculty to state-supported secretaries of 4.5, and faculty to total number of secretaries of 3.4. The desired ratio was 2.7 (faculty to total number of secretaries).

As far as computer accessibility is concerned, the average percentage of faculty with PC or terminal in his or her office was 62%. The average number of general purpose computer terminals per student is .08 (exclusive of those schools requiring the purchase of PC's) and these terminals are available, on the average, 102 hours per week. In the survey, only three engineering schools require students to purchase personal computers. Of all the schools surveyed, 60% require the students to take a course in a lab equipped with PC's. Computer maintenance costs are typically borne by some combination of state operating budgets, research funds and student fees. In fact, about 30% of the respondents indicated the imposition of a supplemental fee for engineering students to help bear the high costs of an engineering education.

CONCLUSIONS

1. The conclusions of the Kemper Report of 1982 are still very much valid today. There is still a decline taking place in the quality of engineering education caused by overenrollment in engineering schools. Whereas undergraduate enrollments seem to have peaked and are on a slight decline, this is more than compensated for by an increase in graduate enrollments in engineering.

2. The quality of the undergraduate engineering student remains excellent, and will continue to improve as enrollment limitation plans put into effect by many engineering schools take effect. However, there is an indication that the very top BS degree students are not continuing to graduate school, but are pursuing careers in industry, attracted by high salaries. It will be necessary to offer much higher stipends for graduate fellowships and assistantships to ensure that the very best students graduating from U.S. engineering schools continue on to graduate school. Such stipends should amount to 50% of the starting salaries of BS engineers, amounting to $13,000 to $15,000 per student with all tuition and fees paid. Such stipends should be the rule, and not just that provided for a few exceptional students.

3. Engineering faculty have done an outstanding job of handling large enrollments, introducing new computer technology into the curriculum, and maintaining a strong thrust towards research. However, the academic environment available to the faculty member is eroding due to lack of space, obsolescence of equipment, and lack of support staff. An academic career is losing its desirability so that the new engineering faculty do not always come from the top ranks of PhD's.

4. Lack of space for engineering schools is a very critical problem, relatively little new construction has been completed during the past five years in spite of very high enrollments. Even some of the current space is unsuitable due to lack of power and air conditioning for new technology that has been introduced over the past few years. A massive building program needs to be initiated, with total cost well over one billion dollars, in order to provide the necessary space for quality engineering education.

5. The equipment problem facing engineering schools was clearly enumerated in the Kemper Report. Since that time, there have been significant increases in equipment funding, especially over the past year, both due to increases from state budgets and increases in donations of equipment. However, maintenance budgets have not kept up with these increases. It is recommended that tax deductibility be provided for maintenance of donated equipment, to encourage industry to provide maintenance along with the gift. Further, it is recommended that university administrations provide maintenance budgets that will be compatible with equipment budgets, so that provisions for maintenance are included at the time of purchase. The increases in equipment budgets are welcome, but still far from adequate to satisfy "catch-up" needs as well as continuing needs.

It becomes apparent that state budgets taken together with industrial donations will not be adequate for "catch-up" and that a federal matching grant program will be necessary to bring the engineering laboratories, both teaching and research, up to an acceptable level.

6. An area often overlooked is the support needed for engineering programs, including technicians, secretaries, and teaching and research assistants. Overenrollments have placed increased demands on support services, yet university administrations seem slow to react to these needs.

Appendix I

RESPONSES RECEIVED FROM THE FOLLOWING INSTITUTIONS:

University of Alaska
University of Arizona
University of Arkansas
University of California, Davis
University of California, Los Angeles
University of Cincinnati
Clemson University
Colorado State University
University of Delaware
University of Florida, Gainesville
University of Hawaii
University of Idaho
University of Illinois, Urbana
Iowa State University
University of Iowa
Kansas State University
Louisiana State University
University of Louisville
University of Massachusetts, Amherst
University of Maine, Orono
University of Minnesota
University of Mississippi
Mississippi State University
University of Missouri, Columbia
University of Missouri, Rolla
University of Nebraska
University of Nevada, Reno
University of New Hampshire
New Mexico State University
University of New York, Stony Brook
University of Wisconsin, Madison
University of Wisconsin, Milwaukee
North Carolina State University, Raleigh
North Dakota State University
Ohio State University
Oklahoma State University
Oklahoma University
Oregon State University
Pennsylvania State University
Purdue University
University of South Carolina
Virginia Polytechnic Institute
Washington State University
University of Washington, Seattle
West Virginia University
University of Texas, Austin
Texas A&M University
Texas Tech. University
Utah State University

Appendix II

University _____

Respondent _____

Address _____

Part I. Enrollment Data*

a. Total number of undergraduate engineering students (FTE) for each of the past 5 years:

1984-85 _____
1983-84 _____
1982-83 _____
1981-82 _____
1980-81 _____

b. Total number of MS students (FTE) for each of the past 5 years:

1984-85 _____
1983-84 _____
1982-83 _____
1981-82 _____
1980-81 _____

c. Total number of PhD students (FTE) for each of the past 5 years:

1984-85 _____
1983-84 _____
1982-83 _____
1981-82 _____
1980-81 _____

d. Total number of faculty (FTE) by year:

1984-85 _____
1983-84 _____
1982-83 _____
1981-82 _____
1980-81 _____

*In your replies, please use the following definitions:

A full-time equivalent student (FTE) is determined by the number of student credit hours offered per semester (or quarter) to all students taught by the faculty of the college of engineering and divided by fifteen for undergraduate students, by twelve for master's level students, and by nine for doctoral level students.

A full-time equivalent faculty member (FTE) is determined by the sum of all the positions and partial positions of professors (in any rank), instructors, and lecturers in the college of engineering that are charged to the instructional function. The fraction of faculty effort totally or partially charged to research, or public service, and graduate assistants are not included in this count.

Part II. Quality of Students

a. Incoming Freshmen

	1984	1983	1982	1981	1980
ACT scores	___	___	___	___	___
SAT scores	___	___	___	___	___
High School ranking (average percentile)	___	___	___	___	___

Comments:

b. Graduating Seniors

Year of graduation	1984	1983	1982	1981	1980
Avg. quarters/semesters for graduation	___	___	___	___	___
EIT Exam (% passing)	___	___	___	___	___
Avg. GPA	___	___	___	___	___

Comments:

c. New Graduate Students

	1984	1983	1982	1981	1980
Avg. GPA as undergraduates	___	___	___	___	___
Avg. GRE	___	___	___	___	___
% Foreign	___	___	___	___	___

d. Please indicate any plans currently in place to limit future undergraduate enrollment. Give the nature of this plan.

Part II. Quality of Students (Continued)

e. What percentage of your faculty FTE are in Electrical and Computer Engineering?

1984-85 _____
1983-84 _____
1982-83 _____
1981-82 _____
1980-81 _____

1986-87 _____ (Projected from current values)

f. What percent of the total of your Junior and Senior FTE students are in Electrical and Computer Engineering?

1984-85 _____
1983-84 _____
1982-83 _____
1981-82 _____
1980-81 _____

1986-87 _____ (Projected from current enrollment)

Part III. Quality of Faculty (Base your responses on data for academic year 1984-85)

a. Percentage of current faculty (Assistant Professors or above) with PhD or equivalent: _____

b. Average number of faculty publications in refereed journals per year over the past five years: _____

c. Average age of current faculty, Assistant, Associate and Full Professors: _____

d. Percentage of lecture courses taught by graduate assistants:

(1) in engineering departments _____

(2) in supporting departments (math, physics, computer science, etc.) _____

e. Full time, post PhD industrial experience of faculty (person-years/person): _____

f. Percentage of faculty members holding elected honorary membership grade in professional societies:

(Fellow of ASME, IEEE, etc.) _____

Number of faculty elected to NAE, NAS _____

g. Number of faculty who have published nationally-marketed textbooks: _____

h. Average 9-month faculty salaries:

Graduate teaching assistants and/or graduate teaching associates _____
Assistant professors _____
Associate professors _____
Professors _____

i. Number of faculty who have voluntarily resigned during the past two years:

For employment in industry ____
For employment at other colleges and universities ____
For early retirement ____

j. Percentage of faculty with research grants in contract within the past year: _____

k. Percentage of faculty taking advantage of the sabbatical leave opportunity on a regular basis: _____

l. Percentage of faculty actively utilizing computer resources
in instruction _____
in research _____

m. Percentage of faculty actively involved in consulting: _____

Part IV. Space, Facilities, Labs

a. Space:

Instructional Labs	_____ ft^2
Research Labs	_____ ft^2
Faculty Offices	_____ ft^2
Graduate student offices	_____ ft^2
Shops	_____ ft^2
Administration	_____ ft^2
Other	_____ ft^2
Total	_____ ft^2

b. New Buildings

Completed during 1980-84:
- New _____ ft^2
- Renovated _____ ft^2

Currently under construction:
- New _____ ft^2
- Renovated _____ ft^2

In planning:
- New _____ ft^2
- Renovated _____ ft^2

c. What are the average and maximum engineering class (or section) sizes in the following categories, using 1983-84 data:

	Lecture		Lab	
	Avg.	Max.	Avg.	Max.
Freshman				
Sophomore				
Junior				
Senior				
Graduate				

d. What is the average number of students per station in your engineering labs for 1984-85? _____
What was it 5 years ago? _____

e. How many undergraduate engineering lab courses are offered today as compared with 5 years ago? (include labs which are integral parts of lecture courses):

	1980-81	1984-85
No. of UG required lab courses	_____	_____
No. of UG elective lab courses	_____	_____

f. Has your college introduced any new approaches to streamline labs during the past 5 years, (e.g. new technology, use of canned data, et cetera)? Discuss.

Part IV. Space, Facilities, Labs (Continued)

g. Equipment budgets:

	1984-85	1983-84	1982-83	1981-82	1980-81
Institutional equipment budget for engineering	_____	_____	_____	_____	_____
Maintenance budget	_____	_____	_____	_____	_____
Donations (include cash value if equipment)	_____	_____	_____	_____	_____
Total spent on equipment*	_____	_____	_____	_____	_____

h. Do you impose a head tax, differential fee, or other special charge on engineering students?

Yes ____

No ____

If yes, how much? _____

What type and what are the funds used for? _____

i. Are student required to take a course in a laboratory equipped with personal computers? _____

j. Are your engineering students requiredc to purchase their own personal computers? _____ If yes, are the PC's networked to a larger machine? _____ If no, what % of your engineering students do you estimate have purchased their own PC? _____

k. What kind of student access is provided to large computers: Unlimited _____, Internally budgeted _____, External funds required _____.

*Include, for example, equipment bought on money from research overhead return.

Part V. Support (Base your responses on data for academic year 1984-85)

1. Give the number of graduate teaching assistants/associates (FTE). (A graduate teaching associate is normally employed 20 hours/week) _____
   What number is needed to ensure a high quality program? _____

2. What percentage of your current graduate teaching assistants/ associates are not U.S.citizens? _____

3. What percentage of your current graduate teaching assistants/ associates are supported on soft money? _____

4. Give the number of graduate research assistants (FTE) (A GRA normally works 20 hours/week) _____
   What number is needed to ensure a high quality program? _____

5. What percentage of your current graduate research assistants are not U.S. citizens? _____

6. What percentage of your graduate research assistants are funded by externally supported research? _____

7. What is the ratio of state supported FTE technicians to FTE faculty? _____

   What is the ratio of total FTE technicians (include soft money positions) to FTE faculty? _____

8. What would be the desired ratio to ensure a high quality program? _____

9. What is the ratio of state supported secretaries FTE to faculty FTE? _____

   What is the ratio of total FTE secretaries (include soft money positions) to FTE faculty? _____

10. What would be the desired ratio in order to ensure a high quality program? _____

11. What is the ratio of general purpose computer terminals per student FTE? _____

    How many hours per week are these terminals accessible to the students? _____

12. How are your maintenance costs for computer equipment funded?

Part V. Support (continued)

13. What is the level of research "seed" support provided by the institution per faculty FTE?

14. What is the level of operating expenses provided by the institution per faculty FTE? _____
Travel expenses _____.

15. What % of your faculty have either a PC or general purpose computer terminal in his/her office? _____

Mr. BEVILL. Doctor, I know this committee supports your views on that, and particularly on nuclear training. I don't think in the history of our country it has ever been needed any more than we need it now, and I am sure we will be able to do something to work with you on this.

Mr. KERR. Thank you very much.

Mr. BEVILL. Thank you very much.

Mr. ROSCHWALB. Thank you.

WEDNESDAY, APRIL 9, 1986.

CHEMICAL RESEARCH CENTER

WITNESSES

ROBERT F. GOLDBERGER, PROVOST, COLUMBIA UNIVERSITY
H. BERNHARD HAECKEL, DIRECTOR, OFFICE OF PROJECT DEVELOPMENT AND COORDINATION, COLUMBIA UNIVERSITY

Mr. BEVILL. Dr. Goldberger, we will be pleased to hear from you. Doctor, you may proceed as you wish.

Mr. GOLDBERGER. Mr. Chairman, I would like to thank you and the members of your subcommittee—Mr. Myers, Mr. Rudd—for your continued interest in helping us in support of our chemistry research center, and for having us come back to talk with you today.

I am going to give you an update on where we stand since the last time I was here in April of 1985.

I would like to introduce Mr. Bernhard Haeckel, who is Director of Project Development at Columbia University.

Mr. BEVILL. Glad to have you with us.

Mr. GOLDBERGER. As of today, we have received bids for the majority of the construction, and I am pleased to report so far they have confirmed our confidence we can bring in the complete project within the total budget of $27.9 million, the budget that was established originally in the fall of 1984.

Because of the unusual complexity of the project, we have spent a lot of time in precisely defined bid packages in order to avoid unpleasant surprises, and also in order to allow construction to go ahead in parallel with design. Still, we expect to complete the entire project as initially planned before the beginning of the 1988-1989 academic year, and within the final budget that we submitted originally to the Department of Energy.

You may recall that our project comprises three phases. The first phase is the rehabilitation of the Chandler Laboratories, and it began in July of 1984. It is almost complete. The research labs in this part of the project are now in full operation.

Phase two is the construction of a new addition to Havemeyer Hall. It began in January of 1985, and at the present time the construction of the steel frame is almost complete. You can see that here on this photo. Construction of the floors and the exterior shell are scheduled to be completed about a year from now.

The third and last phase is the rehabilitation of Havemeyer Hall itself. You can see it just peaking through there. It will begin right

after the second phase is finished, and it should be completed by July of 1988.

This three-phase schedule reflects the need to implement the project in carefully dove-tailed pieces in order to minimize the disruption of the ongoing research which is very sophisticated and high tech research. There are people working right in the middle of this reconstruction that is going on, and it is quite a juggling act to keep this sophisticated energy research going in the midst of the construction. Our world reknowned Chemistry Department has continued to thrive with all that is going on around them.

Distinctions earned by faculty through the past year have included the largest grant of supercomputer time by the National Science Foundation, the BROIDA prize of the American Physical Society, a new membership in the Nationai Academy of Sciences, the Alcon Award in Ophthalmology, the Tetrahedron Prize for creativity in organic chemistry, and the Presidential Young Investigators Award.

One wonders whether all these trials and tribulations of working in the midst of construction isn't actually conducive to productivity in chemists. But, in any event, the department is very enthusiastic. And, as you can imagine, they can't wait until it is finished.

We very much appreciate the fact that your subcommittee requested increased funding for the project last year, but you know that that funding was ultimately not accepted. Still, our financial schedule does require expenditure well in excess of the $16 million already appropriated.

As we proceed with construction, we are very anxious to avoid costly delays. And for this reason, we come to you now to again respectfully request that the subcommittee approve the appropriation of additional funds for the project in fiscal year 1987.

Thank you for your attention.

[The statement of Dr. Goldberger follows:]

STATEMENT

SUBMITTED TO THE
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT
COMMITTEE ON APPROPRIATIONS
U.S. HOUSE OF REPRESENTATIVES

April 9, 1986

Presented by

Dr. Robert F. Goldberger
Provost

Columbia University in the City of New York

Mr. Chairman, on behalf of Columbia University I would like to thank your Subcommittee and its members for the continued support of our funding requests for the Center for Chemical Research and for the opportunity to appear before you today. My statement is intended to update the Subcommittee on the progress we have made since April 3, 1985 when I last testified before your Subcommittee, and to respectfully request your continued support for the funding of this project.

PROGRESS

The design and contract documents for the entire project were completed in the beginning of this year, including a series of very careful reviews and refinements, and the last bid package is expected to go out shortly. As of today we have received bids for 54% of the work and I am very pleased to report to you that the bids so far have confirmed our confidence that we will be able to complete the project within the total budget, comprising both University and Federal funding, of $27.9 million as established in the fall of 1984 and submitted to the Department of Energy.

Indeed, because of the unusual complexity of the project we have spent more time on the preparation of precisely defined bid packages than initially anticipated in order to insure ourselves against costly surprises, and in order to permit construction to proceed in parallel with design. Our adjusted construction schedule reflects this emphasis on meticulous design and document preparation. However, we still expect to complete the entire project, as initially planned, before the beginning of the 1988/89 academic year and within the final budget submitted to the Department of Energy.

As you may recall, our project comprises three phases. The first phase, the rehabilitation of Chandler Laboratories, began in July 1984 and is now 95% completed. The research laboratories in this part of the project are 100% complete and in full operation. Phase II, the construction of a new addition to Havemeyer Hall, began in January 1985. At the present, the construction of the steel frame is almost complete and we are getting ready for the construction of the floors and the exterior shell. This part of the project is now scheduled to be completed in February 1987. The third and last phase, the rehabilitation of Havemeyer Hall, is

scheduled to commence immediately after the completion of the second phase and to be completed in July 1988. As you know, this three-phase schedule reflects the need to implement the project in carefully dovetailed pieces in order to minimize the disruption to ongoing, highly advanced research. In turn, our heightened emphasis on careful planning and design simply responds to the unusual complexity inherent in a project which combines intricately phased construction within the rehabilitation of landmark structures.

At this time I would like again to express my gratitude to the Department of Energy personnel in the Washington Headquarters as well as the Chicago Operations Office for the highly conscientious and helpful guidance they have provided throughout this process. This guidance has helped us to design and plan the project with the necessary prudence.

I would also like to mention that our world-renowned Chemistry Department has continued to thrive during the construction period. Distinctions earned by faculty through this past year have included the largest grant of supercomputer time given by the NSF Office of Scientific Computing to any chemist, the Broida prize of the American Physical Society, a new membership in the National Academy of Sciences, the Alcon Award in Ophthalmology, the Tetrahedron Prize for Creativity in Organic Chemistry and the Presidential Young Investigator's Award. The Department is enthusiastic about the project and looks forward to its completion.

REQUEST

We very much appreciated the fact that the Subcommittee requested increased funding for our project in the last Fiscal Year. However, that funding was ultimately not accepted. As you know, our financial schedule requires expenditures well in excess of the $16 million already appropriated. As we proceed with construction and are anxious to avoid costly delays, we at Columbia University again respectfully request that the Subcommittee approve the appropriation of additional funding for the project in Fiscal Year 1987.

Mr. BEVILL. Thank you very much, Doctor.

That program is very impressive, and we certainly hope that we will be able to accommodate you this year.

Mr. GOLDBERGER. Thank you.

WEDNESDAY, APRIL 9, 1986.

CIVILIAN NUCLEAR REACTOR PROGRAMS

WITNESS

J. S. ARMIJO, MANAGER, NUCLEAR SYSTEMS TECHNOLOGY OPERATION, GENERAL ELECTRIC COMPANY

Mr. ARMIJO. Good afternoon, Mr. Chairman.

Mr. BEVILL. Pleased to have you with us, Doctor. You can summarize your statement, if you wish.

Mr. ARMIJO. My name is Sam Armijo. I am Manager of General Electric's Nuclear Systems Technology Operation in sunny California. I want to thank the subcommittee for its invitation to participate in these important hearings, and my remarks will focus on DOE's reactor program.

We believe there are two principal goals to be achieved by the program: assurance of U.S. energy security for the long term and, intrinsic to this goal, the expeditious revival of the U.S. nuclear option. A favorable solution to the short-term goal requires the use of a light water reactor, or LWR. The long-term goals will be satisfied with liquid metal reactor technology and the breeder.

The LWR and LMR goals are complementary and, in our opinion, both should be pursued. I have covered rationale and approach to these goals in my written statement, and ask that statement be included in the record.

Mr. BEVILL. Your entire statement will be made part of the record.

Mr. ARMIJO. Today, I will limit my remarks to two programs that can provide near-term progress toward meeting the goals I have stated. First, I would like to voice our support for the light water reactor safety and licensing program that the Department of Energy, in conjunction with the Electric Power Research Institute, has proposed for fiscal year 1987.

An aggressive effort toward licensing and certification of an advanced light water reactor can achieve results that could reopen the U.S. nuclear option within five years. We and others have made great progress on advanced LWR designs in cooperation with our overseas associates, and these designs are available for that effort.

Now I would like to address the liquid metal reactor program. We, at GE, are under contract with the Department of Energy for a comprehensive assessment of our modular liquid metal reactor concept, which we call Prism. Rockwell International is pursuing a competing concept. Completion of these assessments was scheduled for fiscal year 1987 with a fiscal year 1987 budget of $19.3 million for both contractors' total.

The purpose of this effort is to determine if there is a technically and economically realistic solution to the unfavorable economics and very high demonstration costs of large LMR plants. We believe the results of DOE's innovative LMR program are vital for an effective program and urge the committee to provide the contract funds for completion as planned.

This effort should receive top priority, in our opinion, for the program because it is critical to the commercial application of the program's substantial technology investment and output. To date, we are very encouraged with the progress of the modular reactor concept and, as you have heard, the concept is equally used in the high temperature gas reactor program.

We believe this technology offers this country a unique potential to design a fully self-protecting liquid metal reactor. Recent tests at EBR II have dramatically demonstrated the technical feasibility of a passively safe nuclear reactor. Since our concept is small—135 megawatts—it can be tested full-scale at moderate cost and thus provide the basis for a major reduction in the regulatory constraints which have contributed so heavily to the high cost of large, monolithic systems.

With regulatory controls limited to a smaller portion of the plant, modular LMRs should have scaling characteristics similar to fossil plants which show only a small penalty with small unit sizes. By applying standard certified units of this type, utilities can greatly reduce their risks, financing risks, in these systems with these plant systems, and provide the flexibility to economically serve a very wide range of low-growth requirements.

While the results to date are promising, they are incomplete and cannot be concluded with the proposed DOE 1987 resource levels. However, with the originally planned effort we can deliver technical and economic assessments with sufficient depth to judge how this technology would fare in the marketplace. We will be able to present a definitive plan towards commercialization on completion of this effort in fiscal year 1987.

We believe these conclusions are necessary to commercially exploit our substantial and continuing technology investment in the LMR and breeder technology, and to regain our nation's leadership position in the application of civilian nuclear power.

Thank you very much for your attention.

[The statement of Mr. Armijo follows:]

J. S. ARMIJO VERBAL TESTIMONY

TO HOUSE ENERGY & WATER DEVELOPMENT SUBCOMMITTEE
UNITED STATES CONGRESS - APRIL 9, 1986

MY NAME IS SAM ARMIJO. I AM MANAGER OF GENERAL ELECTRIC'S NUCLEAR SYSTEMS TECHNOLOGY OPERATION. I WANT TO THANK THE SUBCOMMITTEE FOR ITS INVITATION TO PARTICIPATE IN THESE IMPORTANT HEARINGS REGARDING THE NATION'S CIVILIAN REACTOR PROGRAM.

WE BELIEVE THERE ARE TWO PRINCIPAL GOALS TO BE ACHIEVED BY THE PROGRAM:

ASSURANCE OF U.S. ENERGY SECURITY FOR THE LONG TERM,
AND INTRINSIC TO THIS GOAL, THE EXPEDITIOUS REVIVAL
OF THE U.S. NUCLEAR OPTION.

A FAVORABLE SOLUTION TO THE SHORT TERM GOAL REQUIRES THE USE OF THE LIGHT WATER REACTOR (LWR). THE LONG TERM GOAL CAN BE SATISFIED WITH LIQUID METAL REACTOR TECHNOLOGY AND THE BREEDER. THE LWR AND LMR GOALS ARE COMPLIMENTARY AND BOTH SHOULD BE PURSUED.

I HAVE COVERED THE RATIONALE AND APPROACH TO THESE GOALS IN MY WRITTEN STATEMENT, AND REQUEST THAT THE STATEMENT BE INCLUDED IN THE RECORD. TODAY I WILL LIMIT MY REMARKS TO TWO PROGRAMS THAT CAN PROVIDE MAJOR NEAR TERM PROGRESS TOWARDS MEETING THESE GOALS.

FIRST, I WANT TO VOICE OUR SUPPORT FOR THE LIGHT WATER REACTOR SAFETY AND LICENSING PROGRAM THAT DOE, IN CONJUNCTION WITH EPRI, HAS PROPOSED FOR FY1987. AN AGGRESSIVE EFFORT TOWARD LICENSING AND CERTIFICATION OF AN ADVANCED LWR CAN ACHIEVE RESULTS THAT REOPEN THE U.S. NUCLEAR OPTION WITHIN 5 YEARS. WE AND OTHERS HAVE MADE GREAT PROGRESS ON ADVANCED LWR DESIGNS IN COOPERATION WITH OUR OVERSEAS ASSOCIATES, AND THESE DESIGNS ARE AVAILABLE IN THIS EFFORT.

NOW I WOULD LIKE TO ADDRESS THE LIQUID METAL REACTOR PROGRAM.

CURRENTLY WE ARE UNDER CONTRACT WITH DOE FOR A COMPREHENSIVE ASSESSMENT OF OUR MODULAR LMR CONCEPT WHICH WE CALL PRISM. ROCKWELL INTERNATIONAL IS PURSUING A COMPETING CONCEPT. COMPLETION OF THESE ASSESSMENTS WAS SCHEDULED FOR FY87 WITH A FY87 PROGRAM COST OF $19.3 MILLION. THE PURPOSE OF THIS EFFORT IS TO DETERMINE IF THERE IS A TECHNICALLY AND ECONOMICALLY REALISTIC SOLUTION TO THE UNFAVORABLE ECONOMICS AND VERY HIGH DEMONSTRATION COSTS OF LARGE PLANTS. WE BELIEVE THE RESULTS OF DOE'S INNOVATIVE LMR PROGRAM ARE VITAL FOR EFFECTIVE PROGRAM GUIDANCE AND URGE THE SUBCOMMITTEE TO PROVIDE THE CONTRACT FUNDS FOR COMPLETION AS PLANNED. THIS EFFORT SHOULD RECEIVE TOP PRIORITY IN THE LMR AND BREEDER PROGRAM SINCE IT IS CRITICAL TO THE COMMERCIAL APPLICATION OF THE PROGRAM'S SUBSTANTIAL TECHNOLOGY OUTPUT.

WE ARE ENCOURAGED WITH THE PROGRESS OF THE MODULAR REACTOR CONCEPT. WE BELIEVE THIS TECHNOLOGY OFFERS A UNIQUE POTENTIAL FOR A FULLY SELF PROTECTING REACTOR. SINCE OUR CONCEPT IS SMALL IT CAN BE TESTED FULL SCALE AT MODERATE COST AND THUS PROVIDE THE BASIS FOR MAJOR REDUCTION OF REGULATORY CONSTRAINTS THAT HAVE CONTRIBUTED TO THE HIGH COSTS OF THE LARGE MONOLITHIC SYSTEMS. WITH REGULATORY CONTROLS LIMITED TO A SMALLER PORTION OF THE PLANT, MODULAR LMR's SHOULD HAVE SCALING CHARACTERISTICS SIMILAR TO FOSSIL PLANTS WHICH SHOW ONLY A MINOR COST PENALTY WITH SMALL UNIT SIZES. APPLICATION OF STANDARD, CERTIFIED UNITS OF THIS TYPE WOULD GREATLY REDUCE UTILITY FINANCING RISKS AND PROVIDE THE FLEXIBILITY TO ECONOMICALLY SERVE A WIDE RANGE OF LOAD GROWTH REQUIREMENTS.

WHILE THE RESULTS TO DATE ARE PROMISING, THEY ARE INCOMPLETE AND CANNOT BE CONCLUDED WITH THE PROPOSED DOE FY87 RESOURCE LEVELS. HOWEVER, WITH THE ORIGINALLY PLANNED EFFORT WE CAN DELIVER TECHNICAL AND ECONOMIC ASSESSMENTS WITH SUFFICIENT DEPTH TO JUDGE HOW THIS TECHNOLOGY WOULD FARE IN THE MARKET PLACE. WE WILL ALSO BE ABLE TO PRESENT A DEFINITIVE PLAN FOR PROCEEDING TOWARD COMMERCIALIZATION.

THESE CONCLUSIONS ARE NECESSARY TO COMMERCIALLY EXPLOIT OUR SUBSTANTIAL AND CONTINUING TECHNOLOGY INVESTMENT, AND TO REGAIN OUR NATION'S LEADERSHIP POSITION IN THE APPLICATION OF CIVILIAN NUCLEAR POWER.

59-750 O—86——14

STATEMENT OF

JOSEPH S. ARMIJO
MANAGER
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ON

CIVILIAN REACTOR PROGRAMS

BEFORE THE

SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT
HOUSE APPROPRIATIONS COMMITTEE

APRIL 9, 1986

My name is Joseph S. Armijo. I am Manager of General Electric's Nuclear Systems Technology Operation. I want to thank the subcommittee for your invitation to participate in these important hearings and will direct my statement to possible developments that could aid nuclear power in the future in the U.S.

PRINCIPAL GOALS

We believe there are two principal goals to be addressed in the DOE Civilian Reactor Program.

1. A focused program that assures U.S. energy security for the long term, and to this end
2. Revival of the U.S. nuclear option on an expeditious basis.

A favorable solution to the short term goal implies the use of the light water reactor.

The long term goal can be satisfied with Liquid Metal Reactor (LMR) technology and the breeder. The LWR and LMR goals are complimentary. A resumption of U.S. LWR orders will act as a constraint on fossil fuel prices and increase the commitment of uranium resources. Development of a U.S. LMR option will in the long run limit potential uranium price increases resulting from the expanded use of LWRs while providing a means for regaining U.S. nuclear leadership and influence in international nuclear policy. Both goals can and should be pursued.

For the future we should also consider the High Temperature Gas Reactor (HTGR) technology for the ultimate purpose of providing an alternative to the fossil production of industrial process heat, thus allowing nuclear power to further contribute to the national well being.

PROCESS AND RESPONSIBILITIES

While there are many specific constraints to a viable U.S. nuclear option the most significant are institutional factors beyond the control of the private sector. To be more specific, the existing U.S. regulatory practices and procedures controlling the environment for construction of nuclear plants make their schedules too long, their cost too high, and their unpredicability too great.

General Electric supports legislative reforms in the licensing of nuclear plants. We support one step licensing, limits to backfitting and pre-approval of sites. To be successful, these reforms require a standardized design entailing very large investments before it is clear that an environment necessary for successful nuclear power deployment has returned.

We believe the Federal Government through the DOE should fulfill its responsibility in the current nuclear hiatus by providing a program that assures that nuclear power plants can be designed, constructed and operated in a reasonable and predictable environment in the U.S. Independent of the technology, key to this assurance is the final NRC certification of a plant design. The DOE program should be directed towards developing and proving designs with features that can reduce regulatory scope over the plant design, construction and operation. For this effort to be successful each reactor design effort must define the approach to meeting regulatory requirements that will allow sufficient freedom in the plant's construction and operation to control the excessive costs associated with recent U.S. nuclear plants. It

must also define developments, analyses and demonstrations that will be necessary to achieve these goals. The DOE should carry out the specified program, at least to the point where there is NRC certification and an assurance of a reasonable U.S. environment to accept the risk of proceeding with new nuclear projects. Other institutional constraints such as financing and public acceptance will follow if we can gain control over the cost and schedules of our plants.

Proposed LWR Programs

We believe that the Government can help restore the LWR option in the U.S. by concentrating support in two areas - licensing of the Advanced LWRs and advancement of the mid-size LWR program.

Current U.S. licensing has large uncertainties for utilities that might be contemplating nuclear additions and our own experience with the GE Standard Safety Analysis Report (GESSAR) has not been good. We have been in favor of standardization from the beginning, and were the first to pursue a license for a standard BWR in 1973. However, continued changes in NRC rules leave us 13 years later still pursuing certification, after the expenditure of tens of millions of dollars in the licensing process alone. Our experience is by no means unique.

Government sponsorship of NRC certification of Advanced LWR designs will provide the proof that institutional reform has really taken place and restore confidence in the licensing process. The process we see is as follows:

- An Electric Power Research Institute (EPRI) requirements program is in progress and will provide the Advanced LWR requirements.
- Industry will provide the Advanced LWR designs which meet those requirements. In our case, the ABWR design developed jointly by GE and its Japanese associates represents an investment in excess of $200 million.
- The Government provides a program that results in NRC certification. This includes both final design approval and the public hearing process leading to certification. It also includes any supporting effort that may be required to realize a rational certification through these processes.

A second way in which the Government can help the LWR option is through support of the mid-size LWR program. If successful, this program will permit economic nuclear deployment in smaller increments therefore at lower financial risks. The EPRI has initiated a modest conceptual study of mid-size LWRs with the primary objective of being cost-competitive with coal; employing passive safety features to the maximum extent possible, thus minimizing the safety envelope for review. This is viewed as a way to overcome the traditional scaling penalties associated with the smaller nuclear unit sizes. We are very encouraged at the results to date, which may be applicable not only in the U.S. and may also permit us to exercise leadership abroad. We believe a modest test and assessment program is appropriate to determine the potential of the mid-size concept. How industry would proceed beyond this to a final design and certification will depend not only on the test results but also on U.S. need and the environment for nuclear at the conclusion of the mid-size concept assessment.

The type of program I have outlined can be completed and produce definitive results within a five year period and I believe could go far toward meeting the critical goal of reviving the nuclear option in the United States.

Advanced Reactors

The Advanced Reactor Subpanel Report of the Energy Resources Advisory Board (ERAB) has recommended three key goals for advanced reactors.

1. Timely development of an efficient and economically superior advanced reactor system for application on the nation's electric power systems, building on the vast base of LWR experience and the knowledge gained from 40 years of applied R&D, both here and overseas.

2. Maintenance of U.S. influence in international policy-making concerning civilian nuclear power and non-proliferation by remaining in the vanguard of advanced reactor R&D and sharing on appropriate bases the generic results with the rest of the world.

3. Maintenance of the U.S. as a competitive supplier of nuclear power systems to the world markets by assisting the U.S. industrial community in development of superior proprietary designs, products, and skills through transfer of technology from its advanced R&D program.

Proceeding toward these goals provides an opportunity for the U.S. to act so as to help maintain our non-proliferation objectives while helping our friends and becoming leaders in the attempt to develop an energy secure world. The opportunity arises because present breeder development programs outside the United States may be going down the wrong track. The developmental breeders already built and being built today are technically successful, but are so costly as to be economically impractical. The plans abroad are to serially build additional large multi-billion dollar plants with the hope that the experience gained will ultimately lead to an economically practical plant. But each plant costs billions of dollars and takes of the order of a decade to put into operation. It is not clear that the process will converge. Indeed, in Japan high costs have led to a slowdown in the program, and in Europe where the high costs have dictated a multi-nation approach it has been difficult to reach agreements on the next proposed plant.

In recognition of this situation the Department of Energy program has been investigating a new approach to breeder development. The idea is to look at small sized units of the order of 100 to 300 megawatts which can be joined in arrays to form large plants. Because of their small size the "modular" units can have the advantage of shop fabrication. In addition, the small size permits fail safe emergency cooling systems which are independent of the balance of plant outside of the modules. The balance of plant can therefore be constructed to high quality industrial standards, rather than to the astronomically expensive nuclear safety standards. Further, because of the small size a demonstration module is relatively inexpensive to build. Once it is built, tested, and licensed as a result of the demonstration test, the module becomes the actual building block for the commercial plants.

We are encouraged with the progress of the modular reactor concept. We believe this technology offers a unique potential for a fully self protecting reactor assembly. This in turn can provide the basis for major reduction of institutional constraints that have led to the current high costs of the large monolithic systems. With regulatory controls limited to a smaller portion of the plant, nuclear plants should have scaling factors more like fossil plants which show only a minor cost penalty with small capacity levels. This would then open the opportunity for unit sizes that greatly reduce financial risks and provide the utilities with the ability to economically meet their load growth patterns.

In view of this promise, we believe the modular reactor development should be maintained and expanded when appropriate. Limited studies will never provide the degree of confidence necessary to proceed with commercialization of this concept.

Only with a final design and regulatory certification will it be possible to assure such a concept can realize their full potential.

With future constraints on funding expected we believe it important to proceed with such a focused advanced reactor program. If there is any one lesson we should have learned from our past nuclear experience, it is that basic technology without the generally larger and higher risk effort of integration into specific proven designs does not lead to the development of viable plants to meet our electrical needs. Therefore the development programs should concentrate on developing economic plant designs, with the technology programs providing only the critical information necessary to carry out the design.

Our planning shows development, design, construction and operation of a modular reactor assembly test could be completed in about 8 years for a total cost of about 600 million dollars. This effort would provide the basis for a final regulatory certification of the assembly. The program would be expected to prove the reactor assembly's self-protection features and provide the public and political confidence that will be necessary for limiting regulatory control to the reactor assembly and fuel handling facilities of the plant. It would also provide the confidence that plant cost estimates are predictable and can be reasonably assured.

There are, of course, risks in such a venture. As indicated earlier, the economics of the modular approaches are primarily based on constructing a standardized modular plant with practices and procedures more like a fossil plant than those of today's nuclear plants. Studies by our Power Reactor Inherently Safe Module (PRISM) team have shown the cost of vendor supplied components and materials are essentially equal for the average U.S. nuclear and coal plant. However, the site field labor for the average nuclear plant exceeds that for a coal plant by a factor of two and the indirect site labor costs are five times higher. While standardization and experience can reduce the differences, less regulatory control of the construction process is necessary to reduce the cost of the construction process to a level that would make the modular system fully competitive. We do not believe studies or technology developments, regardless of how promising, can assure this one basic goal can be realized but it may be possible to gain this assurance through a successful full scale reactor assembly test. Therefore, we propose that the commitment be made to proceed with a reactor test of the most promising concept and reach a conclusion through final regulatory certification.

International Cooperation

We believe it is possible to gain overseas participation in the development and proof of our modular innovative concepts. The overseas development of new large monolithic systems has proven to be extremely expensive and none has proven to be economically competitive. Therefore we have found a growing overseas interest in our PRISM concept. A selection and firm commitment to a reactor test could bring about a major overseas participation in such projects. We have in the past enjoyed overseas participation in our developments and can likely regain this advantage with a firm commitment to a promising concept.

I should also emphasize the great importance of such a program to our foreign policy non-proliferation objectives. We presently have the self inflicted situation of trying to address the proliferation issue by threatening an embargo on export of U.S. technology to non-cooperating nations, while at the same time slowing the progress of nuclear energy in this country. There is presently a worldwide surplus of supply capacity in every phase of nuclear power. What is it that we will embargo if present trends continue and we lose technological leadership? The suggested program described above can lead not only to increased well-being in the U.S. due to

assurance of energy supply; but also to worldwide well-being as the U.S. is able to maintain its constructive nuclear technological leadership on an international basis; and to influence developments in ways which reduce the threat of spread of nuclear weapons.

CONCLUSIONS

Proceeding with a focused program toward revival of tne LWR option should be our highest priority. In a competitive world the U.S. is one of the few countries which denies itself the use of low cost nuclear power. The need is evident. A nuclear option provides competition and a choice for the utilities when they begin replacing their aging capacity and satisfying the current growth in demand. The action is clear. Prove through a binding regulatory certification that our advanced LWR plants can be constructed and operated in the United States under conditions that permit standardization and reduces the uncertainty associated with our current plants. The cost is modest. New final advanced designs exist through our cooperative efforts with our overseas partners so we can proceed directly with their certification. And we have in place, the industrial infrastructure necessary to provide this option when it is clear we have an environment more conducive to the acceptance of nuclear power.

Proceeding with a balanced advanced reactors program will likely require some critical and difficult decisions. A comprehensive program would include continuation of our base technology developments and proceeding toward the final design and certification of our current innovative reactor concepts. For the LMR, it also includes closing the fuel cycle if we are to realize the full potential of this technology. We believe it would be in the nation's best interest to carry out a comprehensive program, but the current FY86 budget is not sufficient to carry out such a program and the proposed FY87 budget appears to demand further limits to the advanced reactors program.

We now face the possibility that maintaining the expensive technology and fuel development programs and facilities will leave the Advanced Reactors Program with insufficient resources to carry out the most important mission, advanced reactor development. Therefore, we urge the Committee to address this issue and provide guidance on priorities for the advanced reactor program. While we recognize the value of our base technology developments, we do not believe fuel developments deserve our top priority. We, as well as other countries, have sufficient oxide fuel operating experience today. All countries, however, are struggling to reduce plant costs. This is where the problem is, this is where the U.S. program has a lead, and this is where we should focus our resources.

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Dr. Armijo joined General Electric in 1961 and held various engineering and management assignments at the Vallecitos Atomic Laboratory in Pleasanton, California, and at the Breeder Reactor Department in Sunnyvale, California. In 1973 he transferred to the Nuclear Energy Business Operation in San Jose, California where he held the positions of Manager, Core Materials Technology, responsible for Core Materials Testing, Fuel Operations and Testing, Fuel Behavior Analysis and Analytical Chemistry, and the Pellet Clad Interaction Resistant Fuel Demonstration Program. Prior to his current assignment he was Manager, Domestic Fuel Projects, responsible for GE BWR fuel projects and contracts in the United States.

Dr. Armijo holds a B.S. degree in Metallurgical Engineering from Texas Western College, an M.S. degree in Metallurgy from the University of Arizona, and a PhD degree in Materials Science from Stanford University.

Dr. Armijo has published over forty technical papers on light water reactor and breeder reactor plant materials technology, coolant and stress corrosion technology, and fuels technology. In addition, he holds fourteen domestic and foreign patents and several others are pending. His patents include General Electric's Zirconium Barrier Fuel and General Electric's high purity stainless steel Hybrid Control Rod cladding for boiling water reactors.

Dr. Armijo is a Registered Professional Engineer in the State of California, a member of the American Nuclear Society, the Metallurgical Society of AIME and Sigma Xi. In 1983, Dr. Armijo was awarded the General Electric Company's Steinmetz award for engineering achievement, the Industrial Research-100 Award for the development of Zirconium Barrier Fuel, and was the Fuels Division Principal Lecturer at the International Conference on Structural Materials in Reactor Technology.

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Mr. BEVILL. Very good.
Any questions?
Mr. MYERS. Thank you.
Mr. BEVILL. Thank you very much.

WEDNESDAY, APRIL 9, 1986.

ELECTRICAL AND ELECTRONICS ENGINEERING

WITNESS

JOHN A. CASAZZA, ON BEHALF OF THE ENERGY COMMITTEE OF THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS

Mr. BEVILL. Mr. John Casazza, we will be happy to hear from you.

Mr. CASAZZA. Thank you, Mr. Chairman, members of the committee. I am pleased to be here today to present testimony on behalf of the Energy Committee of the Institute of Electrical and Electronics Engineers.

The area we would like to testify in is the area of electric energy systems, electronic storage batteries. And I might just tell you the IEEE has 275,000 electrical engineers as members. Our position, which we repeatedly state, is that electricity has a very important part to play in our nation as far as our economy goes and our security. We have a consistent record of supporting R&D in the area of electric engineering systems and energy storage. We believe it is very important to keep both government and industry involved in these programs.

The advancing of technology requires some very hard, patient effort, requires a considerable investment in capital resources, a very considerable investment in human resources, and we believe these investments should not be wasted. They must be used wisely.

We also believe that programs should not be attacked with vigor one year and abandoned the next. This is a very wasteful process to follow that through. Continuity is needed.

Now we have reviewed the energy systems and storage specific programs fairly carefully, and we are concerned about two things. The lack of funding—and we believe this lack of funding can result in waste of funds that have been appropriated in the past. The proposed DOE program has been properly focused, as we see it. They have concentrated on the high-risk, long-term items. These are things that will not be undertaken by industry. And they have concentrated on the items that are important to the country as a whole, both economically and from the viewpoint of national security.

We recommend that in your deliberations in balancing your budget funds you give priority to three things in this budget: first, the electric field health effects; second, the nuclear electromagnetic pulse effects, EMP effects, and their effects on electric power systems; and third, the development of a sodium/sulfur battery.

I would like to discuss each of these just for a few minutes, or for one minute each, and tell you why we think these are important.

The field effects appropriation is facing a significant reduction in 1987. This will slow down existing work and won't allow any of the additional work needed. This lack of knowledge is going to come at a very important time from the viewpoint of national interest. The various States are on the verge of enacting legislation that will allow or disallow the building of electric transmission lines.

It is very important the Federal research be completed and made available because of its credibility, the credibility of the knowledge obtained from these programs, because, from someone not having any vested interest, it is going to be very important in the legislation that is adopted.

The electromagnetic pulse effects, these can be caused by high-level nuclear blasts which will affect the operation of electric power systems. The appropriation in this area is very drastically being reduced.

Now, these EMP effects can disrupt the functioning of electric power systems causing public and economic chaos. I think R&D is important in these areas. It is important to national security and should not be forgotten.

The last of the technical areas is the question of sodium/sulfur battery, and we are pleased to see the funding has been relatively kept up in this area, although there is some reduction. We believe these batteries are important to wise use of fuels in the country, a top national item, and the wise use of capital, minimizing of the capital requirements by the electric utilities, thereby minimizing rates. So, we see this as a top priority.

Last, but not least, none of these programs work well without adequate manpower, without adequate leadership capabilities. We think funding is needed to provide for these manpower needs in the Department of Energy, not only to run the programs but to ensure the transfer of the technology.

One mistake I think we made in the past, we developed technology, and it has not been transferred to the civilian sector where public bodies and industries can make use of it. So we think that providing the manpower and the funding to make this technology transfer possible is very important.

This concludes what we think, and the details are in our statement. I would be pleased to answer any questions, if you have any.

[The statement of Mr. Casazza follows:]

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STATEMENT

BY

MR. JOHN A. CASAZZA

On behalf of the

ENERGY COMMITTEE

of the

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS

on

ELECTRIC ENERGY SYSTEMS & ENERGY STORAGE SYSTEMS

Before the

SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

HOUSE APPROPRIATIONS COMMITTEE

April 9, 1986

My name is Mr. John A. Casazza and I thank you for the opportunity to appear before you today on behalf of the Energy Committee of the Institute of Electrical and Electronics Engineers (IEEE). The IEEE is the world's largest technical professional society with over 275,000 members worldwide, more than 226,000 of whom live and work in the United States.

The IEEE has an official Institute position paper on "The Role of Electricity in the U.S. Economy" which has emphasized the fundamental importance of energy availability to the welfare and economic health of society. This position recommends an increased role for electricity in the nation's energy economy and calls for increased support of research and development programs to improve electric power systems' efficiency and reliability, as well as to provide advanced energy conversion technologies.

The IEEE has consistently supported the Electric Energy Systems (EES) and the Energy Storage Program (STOR) in testimony before Congressional Committees having budget oversight responsibilities. We strongly support the DOE's emphasis in this years' budget and we support the continuation of these programs. A long-term commitment to research in such complex and critical areas is essential. Continuity of research is espoused by most; however, keeping both govern-

ment and industry involved in a consistent way is not simple. Research does not have immediate paybacks. Advancing technology requires hard, patient and deliberate efforts for an extended period. Further, to advance technology in this complex world requires a significant investment in people and capital resources. It should not be attacked with vigor in one year or one administration and totally abandoned in the following. Because of the importance of safety and reliability in electricity supply, many new technologies must show great promise in order to be accepted by the electric utility industry. Sharing the risk on these projects as government and industry must, is a particularly difficult problem when budgets change dramatically from year to year.

We have reviewed the current program plan and are concerned that the lack of funding will severely curtail important research efforts from reaching a successful conclusion. The reduction in funding from 30.1 million to 16.2 million will have an adverse impact on program administration, continuity and coordination. IEEE has serious concerns about this very issue, especially when research funds are limited.

The EES and STOR research programs are designed with a knowledge of the energy requirements of the United States and the mandated rules of funding research given by the Department of Energy. The guidelines for what is appropriate for active government support are well articulated. The government involvement is principally focused on areas that are crucial to the economic well-being and security of the nation and are high-risk and long-term programs. These programs cannot or will not be attempted by non-government entities. Industry, principally through the Electric Power Research Institute (EPRI), places emphasis on the solution of near-term problems. Manufacturers generally have not supported long-range high-risk research, because they require a return on their research investments within five years or less. Tax structures, foreign government-supported competition, and the growing cost-price squeeze all tend to limit manufacturer research support. The research that does exist is directed toward improvement of existing lines of equipment in which there is already a heavy investment; in addition, internally supported research on new technologies is limited. Utilities' support of research is restricted not only by financial conditions which are increasingly severe in some regions of the country, but also by regulation and local rate based pressures.

Appropriate government support of long-term, high-risk research is severely compromised by decreased funding levels. However, the current DOE administrators seem to have a sound understanding of the research needs and of the funding required to meet these needs under the present budget constraints. We urge that this commitment to research in the electrical energy area be consistently followed in the future and expanded when possible.

Given the funding constraints that are evident in the FY 1987 Federal budget, IEEE urges that the EES and STOR research programs be funded with the following priorities:

- Electric field health effects
- Nuclear electromagnetic pulse (EMP) effects on electric power systems

- Continued development of the sodium/sulfur battery

Studies in electric field effects are facing reductions again in FY 87. This is most unfortunate because public concern is continuing to grow over the health-related effects of electric fields. A reduction in funding will certainly not permit any new research; it will result in an undesirable slowing down of current activity. This will come at a time when many state legislatures are considering some form of standards "limiting" electric field effects on humans. Such standards conceived without adequate research and technical foundation would be most detrimental to the public, business and the economy. DOE is attempting to identify problems so that reasonable standards can be established as necessary. It is the responsibility of the federal government, because of its acknowledged credibility in this area, to provide sufficient and unbiased information on the biological effects of electric fields.

Similarly the proposed FY 87 budget would seriously reduce the investigation into the performance of power systems and equipment under the effect of electromagnetic pulses. These pulses could be generated by nuclear blasts at high altitudes in which no physical ground damage may be visible. However, they may produce not only a wide disruption of electric system continuity with resultant economic and public chaos, but also a serious threat to national security. There is insufficient knowledge of these wave forms and their behavior on systems and equipment. Insufficient funding is provided to carry on any new effort and precludes any testing of equipment under these very adverse transient con ditions. Because EMP effects are very foreign to the normal operation of a power system, electric utilities will not do this kind of research. It is important for DOE to continue this research so that information derived from it can be used by the electric power industry where applicable.

IEEE is pleased to see that sodium/sulfur battery research is funded in FY 87, albeit at a reduced level. We believe that the storage option in the nation's mix of energy resources should not be abandoned because of transients in the global energy market. Utilities and others see a need for a better, more efficient, less costly load leveling choice than those presently available and because new baseload plants are so costly and controversial. Electric land transportaion has many potential applications, if a better battery system can be researched and developed. Industry does not have the resources to adequately fund continued support of sodium/sulfur battery research.

There are two additional issues which we believe impact the value of the research being conducted by the EES and STOR programs, which we feel warrant the attention of the Committee. These are:

- Technical leadership
- Technology transfer of successfully completed research

Over the past few years there has been a significant attrition in the inhouse technical leadership in the programs due to the severe reductions in program staff. Meaningful research will only result from adequate internal oversight. We propose funding to increase EES and STOR manpower, which is critically needed to provide quality, professional supervision of the research

monies available. With additional personnel, we see a more productive and viable research effort.

KES and STOR has generated a large quantity of valuable information from its research efforts. However, too little of the information finds its way to the public domain where other scientists and engineers could use it productively. IEEE supports funding to get this research information disseminated in the scientific and industrial communities, not only by publication but by other active mechanisms of technology transfer. Direct discussions of DOE's KES and STOR research findings can help others in the private sector explore promising avenues of research while disregarding investigations that foreshadow failure. Better dissemination of DOE's work will enhance its standing in the research community and spur quality investigators to respond to research proposals.

In summary, one must not lose sight of the hard facts of research. From the inception of the research program to commercial viability, a project may take 10-15 years to complete. We must be working today for systems to be available for commercial use in the 21st century. The Electric Energy Systems and the Energy Storage Programs are both dedicated to important and critical research. It will require long lead times and continuity of funding through the whole R&D cycle to achieve their goals. Research activities that can provide benefits to public health, national security, and the economic viability of our electricity production and electric utility manufacturing industry are deserving of serious consideration for efficient and qualitative funding in FY 87.

Thank you.

WEDNESDAY, APRIL 9, 1986.

PHOTOVOLTAIC SOLAR CELL PROGRAM

WITNESSES

HON. THOMAS R. CARPER, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF DELAWARE

ALLEN M. BARNETT, PROFESSOR, ELECTRICAL ENGINEERING DEPARTMENT, UNIVERSITY OF DELAWARE

Mr. BEVILL. Thank you very much.

Our good friend and colleague, Thomas Carper, is here; and we will be glad to hear from you, Tom.

Mr. CARPER. I will be very brief, Mr. Chairman. I know you have many witnesses to hear.

Let me just say, I appreciate the opportunity to join you and the members of the subcommittee today. If you look at the testimony of Allen Barnett, it says he is a Professor with the Electrical Engineering Department at the University of Delaware. Sometimes I think we have before our committees and subcommittees folks who live out most of their lives in ivory towers. That is, they don't have a real handle on what is going on in the real world.

Allen Barnett is a Ph.D, and he does carry forth in the Electrical Engineering Department at the University of Delaware. But he is a fellow who has also lived in the real world, and for a number of years ran his own business. He is a fellow who has been working in this area for many, many years. I have had the opportunity personally to visit with him and some of the people that are now working under him at the University of Delaware and we have discussed some very exciting opportunities that they are exploring in the area of solar energy.

I think while there is an oil glut today and we have plenty of oil and energy—I filled up my gas tank for 73 cents per gallon last night—there is a tendency for us to maybe become fat, dumb and happy again, and think all is going to be just fine. Some day it won't be, and I think Allen has some ideas that may help us avoid the crunch and make sure it doesn't happen again.

I appreciate the chance to be here and introduce him to you.

Mr. BEVILL. Thank you for your fine introduction there.

We are glad to have you with us, Doctor. We'll be glad to hear from you.

We got Tom's views on many things and work closely with him. One is, certainly the oil glut is temporary.

Mr. BARNETT. I think we all agree with that. Thank you very much.

Thank you, Tom.

Mr. BARNETT. As I am sure everybody here knows, photovoltaics are generating electricity, and very little is generated by oil. Where electricity is generated by oil with the major short-term application, RD cell power generators—and the cost there is the capital cost of the cell and the cost of getting the oil to those remote sites.

I am actually here to tell you about a new approach to making a photovoltaic solar cell. It is a new approach for a high-performance, low-cost, thin solar cell. The approach is based on a semi-conductor

device design approach which is similar to what electrical engineers do for a living, and it is what the semi-conductor industry does.

Basically, what I am going to say is the lessons of the semi-conductor industry in developing microelectronics optical communications computers are also applicable to the development of solar cells. A device design approach would start with first principles and say we don't need a new material or perfect material; we need to find out how to make the materials we have work.

It is not a coincidence that the best semi-conductor material is silicon. They also make the best solar cells. The problem is how do you make those materials in a low-cost thin film form.

I am going to tell you about an example of how to do that. We have got an invention at the University of Delaware which has been licensed to industry that is being developed, that makes solar cells out of thin films of silicon, silicon which is the material of the semi-conductor industry. The laboratory results are up to 12 percent efficient, which is as good as any thin film in the world.

Unfortunately, the current Department of Energy program defines "thin film" as amorphous silicon, a very different material, or as II-VI compounds. They basically have relegated silicon to high efficiency and not to the thin film form. So, it doesn't fit in the program. That is one of the reasons I am here.

There is right now no way to find a way to make it thick. We have achieved a laboratory efficiency up to 12 percent on steel, which is as good as any thin film. The next best efficiency of silicon on steel is 5 percent, which is of course why the DOE has a long negative history.

The problem is, these processes can be low cost but they are not simple. You have to do a lot of things to get there. For example, to grow silicon on steel it doesn't grow on any steel; you have to find a pedigree steel to grow it on. We had to manufacture a steel substrate. This is made continuously. It produces about 40 watts of solar cells and is worth about 50 cents.

After you do that, you have to figure out how to put the silicon down continuously. I have now added about 5 cents of contributed value, and this is the first time silicon has ever been put down continuously on steel, and actually this is the first large area solar cell.

The large area results are not equal to the small area results. They are not even close. But the smaller area results—and this technology in front of me proves that maybe you can get there. The way we got there, which was different from the way anybody else got there, is we went back to first principles and said silicon is the best material. And as electrical engineers we are trained to figure out how to use it. Don't discard it until it is hard to do—figure out how to do it.

We have now figured out how to do it. I would contend a more sophisticated approach, such as that used by the semi-conductor industries applied to polycrystalline silicon films, can lead to efficiencies greater than 14 percent, which is in excess of the goals, costs less than a dollar a watt, and long-term stability. These devices have proven to be stable.

I would like to encourage the Department of Energy to expend the intellectual energy required to include a semi-conductor device design approach in their planning.

I would be pleased to answer any questions.

[The statement of Mr. Barnett follows:]

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Testimony for the Record
Subcommittee on Energy and Water
Development Appropriation
Committee on Appropriations
United States House of Representatives

New Photovoltaic Solar Cell Opportunities

by

Allen M. Barnett, Professor
Electrical Engineering Department
University of Delaware

My thoughts and suggestions on the photovoltaic solar cell program are based on my experience in product development including the management of an electronic component company and at the General Electric Company.

I was the General Chairman of the 18th Institute of Elecrical and Electronics Engineers Photovoltaic Specialists Conference (1985), the largest photovoltaic professional conference in the world. I serve as Chairman of the IEEE Committee for the 19th Conference (1987). I also serve on the program committees for the European Community and Asian Photovoltaic Solar Cell Conferences.

Photovoltaic electricity generation represents a major opportunity. Electricity generation costs are effectively insulated from the cost of oil. The primary short term application is diesel replacement followed by other applications which are not driven by the cost of oil.

It is agreed by most analysts that the low cost photovoltaic electricity generation will be based on the successful development of thin film solar cells. The Department of Energy's current five year research plan has goals for 1988 of 15% for a 50 cm^2 thin film polycrystalline solar cell and 12% for amorphous silicon with a life-expectancy of 30 years. These are good goals and their achievement should lead to low cost thin film solar cells. Unfortunately, the program has also chosen the winning technologies, amorphous silicon and II-VI compounds and their analogues $CuInSe_2$ and CdTe. There is considerable doubt that these materials and technologies chosen by DOE will meet these goals.

The worst thing that the Government can do is pick the winners in advance. The DOE/SERI thin film program is focused on "new materials". These materials are all relatively easy to make in the laboratory, although quite difficult to scale-up for power generation. They have also proven to be limited in performance

and in some cases they are not stable. The traditional semiconductor materials, silicon and GaAs, are locked out of the low cost thin film programs. This "new materials" approach by DOE ignores the lessons of the semiconductor industry where new device designs are used to overcome the deficiencies of the materials. The best behaved semiconductor materials are excluded as well as the device design, development and manufacturing experience of the semiconductor industries.

A semiconductor device approach is based on new designs which lead to improved solar cell performance without requiring perfect materials. It is device design and innovation which fueled the semiconductor electronics industry, including Intel, Texas Instruments and many successful innovative small companies. This high technology industry growth has been fueled by strong support of academic research.

A device design approach for the development of a thin film polycrystalline silicon solar cell might require the invention of a new substrate, a new heteroepitaxial crystal growth process, new optical and electrical device designs and a new method for making the transparent contact. This array of new technology is typical of that required for any new semiconductor device developed for the electronics industry. Although there are clear benchmarks along the way, it will take more than a year to demonstrate a large area laboratory device.

The Department of Energy has indicated that they are only interested in supporting the development of demonstrated solar cells and processes. Accordingly they are limiting themselves to relatively simple approaches. These simple approaches eliminate the opportunities for sophisticated semiconductor device design such as those which lead to the development of the integrated circuit, semiconductor memory, computers-on-a-chip, semiconductor lasers and optical communications. Moreover, elimination of this approach denies the contributions that can be made by modern electrical engineering, EE, techniques. Application of these EE techniques can lead to the long awaited breakthrough in the cost and performance of thin film photovoltaic solar cells.

An example of the device design approach is the new Silicon-Film solar cell on a low cost steel substrate which was invented at the University of Delaware and is being developed by the University and their licensee, Astrosystems. This approach is based on the development and analysis of the device design rules. The approach does not require perfect materials, and in fact can work with relatively fine-grained silicon. The results to date have been very encouraging. Small laboratory solar cells have been made with efficiencies over 12% which is equivalent to the best efficiencies reported by any thin-film solar cell including those with more than ten years of support from DOE. The best result by previous investigators working with silicon on steel was less than 5% efficiency.

The Silicon-Film process is currently being scaled-up. Large area substrates have been developed with areas as large as 800 square centimeters and continuous Silicon-Films have been grown with areas up to 140 cm^2.

More than one million dollars of private funds have been invested in this technology to date, with an additional one million scheduled to be invested over the next two years. Government support is required to complete the development of this new invention. With this support, prototypes of commercial solar cells can be expected in the first year. In the second year laboratory efficiencies over 14% are expected as well as the demonstration of a commercial manufacturing process. Long term stability is also expected which is typical of crystalline silicon devices. The laboratory devices have demonstrated stability.

While there is agreement that the Department of Energy's Photovoltaic Program's thin film goals are appropriate, few specialists expect that the major goals can be reached by 1988 using the materials that they have selected. In spite of the austere budget, opportunities must be created for new ideas. It is time to open the program to all candidate material systems which can meet the goals. In particular the recommendation made by this Subcommittee for fiscal 1986 that a semiconductor device design and development component be added to the present thin film materials research program should be followed. Semiconductor device designs, similar to those used by the microelectronics industry, would be tolerant of faults in the photovoltaic materials and accordingly would not require perfect materials. It is anticipated that this approach can be applied to several thin-film materials which have demonstrated good performance. A few promising photovoltaic materials should be examined for new device designs including thin-film polycrystalline silicon and thin-film polycrystalline gallium arsenide, GaAs.

DOE has investigated several simple approaches to polycrystalline silicon and GaAs which were not successful. The semiconductor device analysis demonstrates why these approaches were limited. If this design methodology had been applied, much effort could have been saved. The Department's bad experience with these simple designs has led them to conclude that they "are not very confident that efficiencies greater than 10% can be obtained from this (polycrystalline films of silicon) material".

A more sophisticated approach to the polycrystalline silicon film problem can lead to efficiencies greater than 14%, costs less than one dollar per watt and long term stability. DOE needs to expend the intellectual energy required to include this semiconductor device design approach in their planning.

The thin-film silicon problem will require some innovative new approaches, most likely in the device design area. This high risk, high payoff program can lead to a true breakthrough in the cost/performance standard for thin-film solar cells.

Since the photovoltaic program is primarily a research program, some longer term stability must be given to the researchers. The constant threat of cutting the budget in half or worse, severely distracts the researchers and planners. It would be most desirable for the planners to recognize that the DOE photovoltaic budget is expected to remain at no less than current levels for the next three years. Better longer term planning has to lead to improved research performance.

The creative energies of our universities and industry can lead to technological and market dominance by the U.S. of this new high technology, rapidly growing industry. Limited encouragement and assistance by the Government can be a very effective catalyst.

Allen M. Barnett
April 9, 1986

Mr. BEVILL. That is very interesting. I think it is very impressive what you are doing.

Do you have any questions?

Mr. MYERS. No.

Mr. BEVILL. It is very simple, I understand. It is an engineer's solution. The solution is the problem.

Mr. BARNETT. Very well stated.

Mr. MYERS. You don't get shocked when you hold that up to the sunlight?

Mr. BARNETT. No. We will put a bunch of them together before anybody gets shocked and try to be careful to keep it from happening.

Mr. MYERS. How long do they last?

Mr. BARNETT. There is no known failure mode. Usually, the package wears out or somebody—actually that doesn't get stolen. It is too valuable to steal. Where they have been put up, they have been put in communities for water pumping. Because the community needs water so badly, it is theirs, and it doesn't get stolen and doesn't break down.

The long-term failure modes in testing are electromechanical, and I think over five years with this material, silicon, you have about a 1 percent failure, mostly mechanical.

Mr. BEVILL. How much money are you requesting?

Mr. BARNETT. I am requesting a half a million dollars. I forgot to say, industry has put a million into this so far and has committed another million over the next two years.

Mr. BEVILL. That is the lowest request we have had today.

Mr. BARNETT. Actually, in the 1986 appropriation you mentioned it, but they didn't do anything, and it would take half a million to get this to a commercial prototype, and another year and another half-million to get it into full-scale manufacturing.

Mr. BEVILL. We always start out slow.

Mr. BARNETT. You guys are okay.

Mr. MYERS. It is those other guys we have trouble with.

Mr. BEVILL. Thank you very much.

WEDNESDAY, APRIL 9, 1986.

HIGHER EDUCATION PHOTOVOLTAIC EXEMPLAR FACILITY

WITNESSES

T. BYRON COLLINS, S.J., GEORGETOWN UNIVERSITY
SAMUEL HARVEY, JR., GEORGETOWN UNIVERSITY

Mr. BEVILL. Father Collins, pleased to have you with us.

Reverend COLLINS. Mr. Chairman, Mr. Myers, members of the committee, I will be very brief.

It was very interesting to listen to the professor from Delaware. As you know, this committee supported us in a project some years back to use the technology that at that time was expensive so we asked for a contribution quite some numbers beyond this and it has worked.

Our facility is working. As the testimony shows you, the amounts of money that photovoltaics is doing has a tremendous impact. The Georgetown facility, as you know, is on the roof of our major building there and in the summer when the peak rate of the electricity goes way up, has made a significant contribution to cutting our electric cost which goes over the whole year.

We just want to thank you and from the technology that the professor is talking about, if we had had that available at the time we would maybe like to try it. If it would work out, we are set so we can put other modules on it and encourage the committee's serious consideration of the professor's thing.

That is where we start. So thank you very much. We are ready to assist the committee in any way.

Mr. BEVILL. You made the best presentation we have heard today, Father. Thank you very much.

Reverend COLLINS. It is a pleasure.

[The statement of Reverend Collins follows:]

GEORGETOWN UNIVERSITY
WASHINGTON, D.C. 20057

OFFICE OF THE PRESIDENT
ASSISTANT FOR
FEDERAL RELATIONS

202/625-3704

HOUSE APPROPRIATIONS SUBCOMMITTEE ON ENERGY AND WATER
FY 1987

WITNESSES

Reverend T. Byron Collins, S.J.
Georgetown University Office of Federal Relations

Mr. Dennis P. Shaff
Director of Contracts, Georgetown University Physical Plant

April 9, 1986

House Appropriations Subcommittee on Energy and Water
FY 1987

Mr. Chairman and members of the Committee, I am Rev. T. Byron Collins, S.J., Assistant to the President of Georgetown University. I am accompanied by Mr. Dennis P. Shaff, Director of Contracts for Georgetown's Physical Plant. We thank you for the opportunity to testify before this Committee.

As I testified before this committee last April, Georgetown University has completed construction and has since October 1984 has put into operation the "Photovoltaic Higher Education National Exemplar Facility" (PHENEF) housed in the Intercultural Center on Georgetown's Campus. This $24 million project is a product of a joint venture between the United States Department of Energy, the United States Congress and Georgetown University to demonstrate the feasibility of photovoltaic power as a future alternative energy source for college and university campus buildings nationwide. The project was partially funded by a $10 million federal grant from the DOE and supplemented through Georgetown resources and special gift contributions.

As the attached report shows that so far the Georgetown project has been successful as it was envisioned and that through continuous engineering refinements and adjustments to the system, the production of the photovoltaic system has been constantly increasing.

On behalf of the University, I would like to express that Georgetown would welcome and appreciate any additional funds which may be available for this program, since there is substantial potential to conduct more extensive and productive research in the area of development and utilization of this photovoltaic technology.

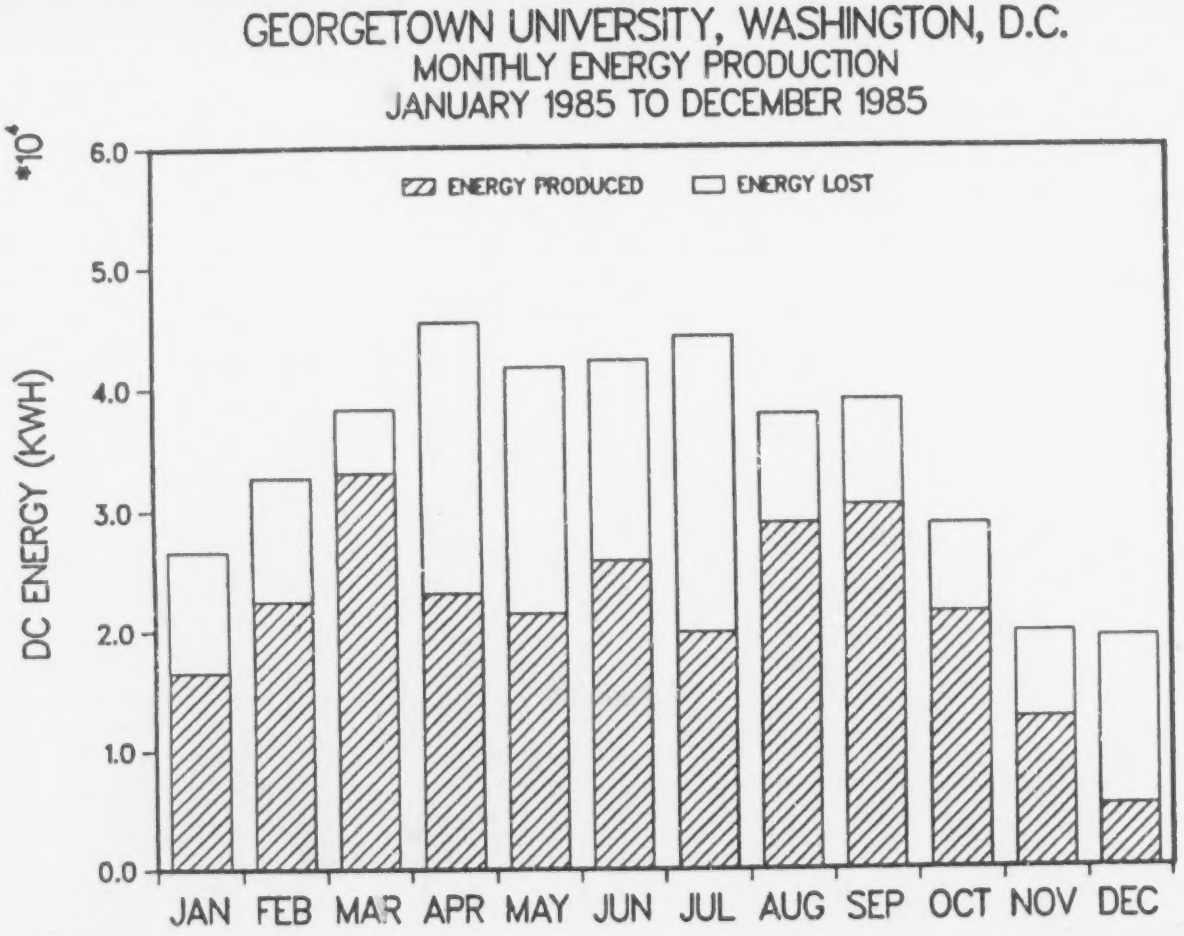
On behalf of our President, Rev. Timothy S. Healy, S.J., we thank you once again for this opportunity to testify.

SAVINGS FROM ICC PHOTOVOLTAIC ROOF

	PHOTOVOLTAIC OUTPUT (AC KWH)	peak rate ($ per KWH)	int. rate ($ per KWH)	off rate ($ per KWH)	weight 25/10/12	fca rate ($ per KWH)	dc gr adj (times tot.)	off. rate (incl.disc.)	(1) ENERGY $ SAVINGS
JUL 84	22,973	0.06410	0.04747	0.03026	0.05192	0.0000383	1.021618	0.0504	1,159
AUG	22,973	0.06410	0.04747	0.03026	0.05192	0.0031340	1.019212	0.0533	1,225
SEPT	22,973	0.06410	0.04747	0.03026	0.05192	0.0048546	1.019212	0.0550	1,263
OCT	22,973	0.05443	0.04813	0.03070	0.04706	0.0043465	1.019212	0.0498	1,144
NOV	22,091	0.05449	0.04813	0.03070	0.04706	-0.0022102	1.017912	0.0434	958
DEC 84	18,262	0.05210	0.04601	0.02935	0.04500	-0.0040568	1.017912	0.0396	723
JAN 85	15,734	0.05210	0.04601	0.02935	0.04500	-0.0078516	1.017912	0.0359	565
FEB	21,599	0.05210	0.04601	0.02935	0.04500	-0.0035939	1.017912	0.0400	865
MAR	31,813	0.05210	0.04601	0.02935	0.04500	-0.0006159	1.017912	0.0429	1,365
APR	22,313	0.05226	0.04617	0.02947	0.04515	0.0001986	1.017912	0.0438	987
MAY	20,893	0.05226	0.04617	0.02947	0.04515	0.0039750	1.017912	0.0475	992
JUN 85	24,965	0.06235	0.04618	0.02947	0.05051	0.0052959	1.017912	0.0540	1,347
JUL	19,303	0.06235	0.04618	0.02947	0.05051	0.0077095	1.017912	0.0563	1,087
AUG	27,991	0.06235	0.04618	0.02947	0.05051	0.001933	1.017912	0.0507	1,420
SEPT	33,853	0.06235	0.04618	0.02947	0.05051	-0.0011515	1.017912	0.0477	1,616
OCT	22,383	0.05226	0.04617	0.02947	0.04515	-0.0047872	1.017912	0.0390	874
NOV	11,400	0.05226	0.04617	0.02947	0.04515	-0.0051867	1.017912	0.0386	441
DEC 85	4,750	0.05226	0.04617	0.02947	0.04515	-0.0042555	1.017912	0.0395	188
									$18,217
TOTAL	389,442 KWH								

03-Apr-86

	P & T Avoided demand p & T Demand (KW)	P & T demand rate ($ per KW) (incl.disc.& dc gr adj.)	(2) P & T DEMAND $ SAVINGS	Distribution Avoided demand Distribution Demand (KW)	Distribution demand rate ($ per KW) (incl.disc.& dc gr adj.)	(3) DISTRIBUTION DEMAND $ SAVINGS	(1)+(2)+(3) TOTAL $ SAVINGS
JUL84	280	$9.20	2,447	280	$5.65	1,503	5,109 JUL 84
AUG	280	$9.20	2,447	280	$5.65	1,503	5,175 AUG
SEPT	280	$9.20	2,447	280	$5.65	1,503	5,213 SEPT
OCT	N/A	N/A	0	280	$5.65	1,503	2,646 OCT
NOV	N/A	N/A	0	280	$5.65	1,503	2,461 NOV
DEC	N/A	N/A	0	280	$6.00	1,596	2,319 DEC 84
JAN85	N/A	N/A	0	280	$6.00	1,596	2,161 JAN 85
FEB	N/A	N/A	0	280	$6.00	1,596	2,461 FEB
MAR	N/A	N/A	0	280	$6.00	1,596	2,961 MAR
APR	N/A	N/A	0	280	$6.00	1,596	2,583 APR
MAY	N/A	N/A	0	280	$6.00	1,596	2,586 MAY
JUN	280	$9.80	2,607	280	$6.00	1,596	5,350 JUN 85
JUL	280	$9.80	2,607	280	$6.00	1,596	5,290 JUL
AUG	280	$9.80	2,607	280	$6.00	1,596	5,622 AUG
SEPT	280	$9.80	2,607	280	$6.00	1,596	5,819 SEPT
OCT	N/A	N/A	0	280	$6.00	1,596	2,470 OCT
NOV	N/A	N/A	0	280	$6.00	1,596	2,037 NOV
DEC85	N/A	N/A	0	280	$6.00	1,596	1,784 DEC
			$17,759			$28,263	$64,248


GEORGETOWN UNIVERSITY, WASHINGTON, D.C.
MONTHLY ENERGY PRODUCTION
JANUARY 1985 TO DECEMBER 1985
*10⁶
DC ENERGY (KWH)
6.0
5.0
4.0
3.0
2.0
1.0
0.0
ENERGY PRODUCED
ENERGY LOST
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC

WEDNESDAY, APRIL 9, 1986.

BASIC ENERGY RESEARCH PROGRAMS

WITNESS

EDEL WASSERMAN, MEMBER, COMMITTEE ON CHEMISTRY AND PUBLIC AFFAIRS, AMERICAN CHEMICAL SOCIETY

Mr. BEVILL. Doctor, your prepared statement will be made part of the record and you may proceed as you wish.

Dr. WASSERMAN. Thank you. My name is Edel Wasserman. I am Associate Director-Technology, Chemical Sciences, E.I. du Pont de Nemours and Company, and a member of the Joint Board-Council Committee on Chemistry and Public Affairs of the American Chemical Society. The Society's Board of Directors has authorized my presentation of this statement before you today.

The American Chemical Society appreciates this opportunity to present its views on the Department of Energy's fiscal year 1987 budget request and to comment upon specific support for research in the chemical sciences under programs of the Office of Energy Research. Specifically, the ACS believes that the appropriate areas of basic energy sciences programs should receive an additional $22 million in fiscal year 1987 for research in reaction kinetics, catalysis, and plant sciences. The Department of Energy must invest more heavily in research that explores the energy-related frontiers of chemistry where there is great potential for contributions to DOE's mission.

The long-term needs of the United States indicate that, as a Nation, we cannot ignore the energy area.

This view is persuasively reinforced in the following excerpt from the National Academy of Sciences/National Research Council Report, "Opportunities in Chemistry":

> Every proposed scenario for energy consumption over the next four decades projects the need to optimize access to every energy source at our disposal. This need is made more urgent as we face the inevitable depletion of liquid fossil fuels because there will also be stiffening constraints imposed by the desire to protect the environment. In this setting, chemistry will continue to be the central scientific discipline in meeting the nation's energy requirements.

The report highlights the fact that over 90 percent of our energy consumption is based on chemical technology, yet the Department of Energy devotes only a modest fraction of its fundamental research program to the chemical sciences. In fiscal year 1985, for example, the eleven fundamental research programs under the Office of Energy Research received a $1.4 billion DOE commitment.

Within this budget, the Chemical Sciences Program, which funds mostly chemical research, is $79.5 million, less than six percent of the total. The Biological Energy Research Program is $12.5 million, less than one percent of the total. Of course, other programs contain chemistry components. For example, the Materials Sciences program devotes $33.7 million of its budget to chemical research. This amounts to 2.4 percent of the total fundamental research budget.

The last column of Appendix I indicates the results of identifying every program element that might be labelled chemical research.

When contributions to chemical sciences are extracted from these fundamental research programs, they amount to approximately $175 million, or 12 percent of the total figure of $1.4 billion.

With chemical technology providing over 90 percent of the energy consumed in the United States, a trend which will undoubtedly continue for the next three decades, 12 percent of the fundamental research budget is an inadequate investment, especially when it is recognized that chemistry is no longer a test tube science. Greater resources are required to provide for the increasingly sophisticated research instrumentation and the increased cost of the support structure needed to carry out high quality research.

In order to meet the enormous challenges posed by new and lower quality energy sources, and at the same time to decrease the environmental impact of energy use—acid rain, smog, et cetera—the United States must develop new catalysts, processes, fuels and extraction techniques, more efficient combustion conditions, a better understanding of the fate of emissions, better emissions controls, and more sensitive environmental monitoring techniques.

As a result, the Department of Energy must invest more heavily in the relevant frontiers of chemistry. These frontiers are clearly delineated in the report "Opportunities in Chemistry", which indicates the many ways that the chemical sciences are ready to meet future challenges, if adequately funded.

As a first step towards meeting these needs, the American Chemical Society endorses the recommendation of the NAS/NRC report that $22 million be added in the appropriate areas of the basic energy sciences programs to support reaction kinetics, catalysis, and the plant sciences.

Increased support and resources must be committed by the Department of Energy to these frontier areas over a sustained period of time. The NAS/NRC report provides a five-year plan for such support—Appendix II. This plan, if followed, would result in an incremental growth of about 2.5 times the chemical research funding, which was available for these areas under the basic energy sciences programs in fiscal year 1985. The Energy Research Advisory Board's Chemistry Ad Hoc Review Panel, in its draft February 1986 report, has endorsed this recommended growth, which is equal to $33 million per year in fiscal year 1985 dollars.

The American Chemical Society supports the increases proposed in the operating budgets of the Chemical Sciences program and the Biological Energy Research program. The Society believes, however, that a larger increase is warranted and could be used effectively. The stakes are too high and the potential benefits to our economy are too significant to postpone adequate funding of these important initiatives.

The Society recognizes that fiscal year 1987 is a year in which budget restraints are being demanded. These times of economic stress are times of difficult priority choices; it is a time for retreat in some areas, and a time for increased investment in areas that will guarantee future progress.

Japan and Great Britain have already identified and intend to provide additional support to these same energy-related research areas. A number of U.S. scientific programs that involve much larger expenditures are under consideration. They show that the

cost of the initiatives detailed in our statement would be modest investments, but ones directly relevant to the DOE mission.

The recent drop in oil prices would lull us into believing we can rely on other energy sources and improve existing ones, but the past decade-and-a-half has shown wide swings in pricing of fossil fuels are to be expected. Resource here is our cheapest form of insurance.

The ACS appreciates the opportunity to express its views. The Society believes that the costs of its recommendations are minimal compared to the many potential benefits derived in helping to insure a stable, long-range energy supply in the U.S. and in reducing the Nation's vulnerability to the uncertainties of foreign oil supplies.

Thank you.

Mr. BEVILL. Thank you.

[The statement of Dr. Wasserman follows:]

STATEMENT OF

EDEL WASSERMAN

on behalf of the

AMERICAN CHEMICAL SOCIETY

to the

SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

COMMITTEE ON APPROPRIATIONS

U.S. HOUSE OF REPRESENTATIVES

on

DEPARTMENT OF ENERGY FY 1987 BASIC ENERGY SCIENCES APPROPRIATIONS

APRIL 9, 1986

Mr. Chairman and Members of the Subcommittee:

My name is Edel Wasserman. I am Associate Director-Technology, Chemical Sciences, E. I. du Pont de Nemours & Co., and a member of the Joint Board-Council Committee on Chemistry and Public Affairs of the American Chemical Society. The Society's Board of Directors has authorized my presentation of this statement before you today. I request that the complete text of this statement be entered into the hearing record.

The American Chemical Society appreciates this opportunity to present its views on the Department of Energy's FY 1987 budget request and to comment upon specific support for research in the chemical sciences under programs of the Office of Energy Research. Specifically, the ACS believes that:

> The appropriate areas of Basic Energy Sciences programs should receive an additional $22 million in FY 1987 for research in reaction kinetics, catalysis, and plant sciences. The Department of Energy must invest more heavily in research that explores the energy-related frontiers of chemistry where there is great potential for contributions to DOE's mission.

The long-term needs of the United States indicate that, as a Nation, we cannot ignore the energy area. Recently, Dr. Edward E. David, Jr., retired President of Exxon Research and Engineering Company, said that, "In energy, as elsewhere, new knowledge is both a critical and a renewable resource. Will the world develop the necessary knowledge in time to avert the next energy crisis? One thing we do know is that remarkable opportunities are emerging in the relevant areas of fundamental chemical science."(1)

This view is persuasively reinforced in the following excerpt from the National Academy of Sciences/National Research Council (NAS/NRC) Report, Opportunities in Chemistry:

> Every proposed scenario for energy consumption over the next four decades projects the need to optimize access to every energy source at our disposal. This need is made more urgent as we face the inevitable depletion of liquid fossil fuels because there will also be stiffening constraints imposed by the desire to protect the environment. In this setting, chemistry will continue to be the central scientific discipline in meeting the nation's energy requirements.(2)

The Report highlights the fact that over 90 percent of our energy consumption is based on chemical technology, yet the Department of Energy devotes only a modest fraction of its fundamental research program to the chemical sciences.

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1. Edward E. David, Jr., "Chemistry and The Next Energy Crisis," The Chemist, January 1986, p. 6.

2. National Research Council, Opportunities in Chemistry (Washington, D.C.: National Academy Press, 1985), p. 34.

In FY 1985 for example, the eleven fundamental research programs under the Office of Energy Research (Appendix I) received a $1.4 billion DOE commitment. Within this budget, the Chemical Sciences program, which funds mostly chemical research, is $79.5 million, less than 6 percent of the total. The Biological Energy Research program is $12.5 million, less than 1.0 percent of the total. Of course other programs contain chemistry components. For example, the Materials Sciences program devotes $33.7 million of its budget to chemical research. This amounts to 2.4 percent of the total fundamental research budget.

The last column of Appendix I indicates the results of identifying every program element that might be labelled chemical research. When contributions to "chemical sciences" are extracted from these fundamental research programs, they amount to approximately $175 million, or 12 percent of the total figure of $1.4 billion.

With chemical technology providing over 90 percent of the energy consumed in the United States, a trend which will undoubtedly continue for the next three decades, 12 percent of the fundamental research budget is an inadequate investment, especially when it is recognized that chemistry is no longer a "test tube" science. Greater resources are required to provide for the increasingly sophisticated research instrumentation and the increased cost of the support structure needed to carry out high quality research.

In order to meet the enormous challenges posed by new and lower quality energy sources, and at the same time to decrease the environmental impact of energy use (acid rain, smog, etc.), the U.S. must develop new catalysts, processes, fuels, and extraction techniques; more efficient combustion conditions; a better understanding of the fate of emissions; better emissions controls; and more sensitive environmental monitoring techniques. As a result, the Department of Energy must invest more heavily in the relevant frontiers of chemistry. These frontiers are clearly delineated in the Report, Opportunities in Chemistry, which indicates the many ways that the chemical sciences are ready to meet future challenges, if adequately funded.

As a first step towards meeting these needs, the American Chemical Society endorses the recommendation of the NAS/NRC Report that $22 million be added in the appropriate areas of the Basic Energy Sciences programs to support reaction kinetics, catalysis, and the plant sciences.

Reaction Kinetics - The amazing potential of lasers and computers for understanding the entire course of a chemical reaction needs to be exploited. Such an understanding could lead to better combustion efficiencies. An increase in combustion efficiency would be worth billions per year to the U.S. economy. Of course, a further important bonus could be the reduction of smog and acid rain.

Catalysis - The full range of sophisticated instrumentation techniques should be brought to bear on the crucial area of catalysis. These techniques extend across the range of homogeneous, heterogeneous, electro-, photo-, and enzymatic catalysis. Advances in catalysis could lead to more efficient production and use of energy sources.

Plant Sciences - The use of natural and artificial photosynthesis, biomass, and genetic engineering of photosynthetic organisms should be facilitated to capture and utilize solar energy in better ways.

Increased support and resources must be committed by the Department of Energy to these frontier areas over a sustained period of time. The NAS/NRC Report provides a five-year plan for such support (Appendix II). This plan, if followed, would result in an incremental growth of about 2.5 times the chemical research funding, which was available for these areas under the Basic Energy Sciences programs in FY 1985. The Energy Research Advisory Board's Chemistry Ad Hoc Review Panel, in its draft February 1986 report, has endorsed this recommended growth, which is equal to $33 million per year in FY 1985 dollars.

The American Chemical Society supports the increases proposed in the operating budgets of the Chemical Sciences program and the Biological Energy Research program. The Society believes, however, that a larger increase is warranted and could be used effectively. The stakes are too high and the potential benefits to our economy are too significant to postpone adequate funding of these important initiatives.

The Society recognizes that FY 1987 is a year in which budget restraints are being demanded. These times of economic stress are times of difficult priority choices; it is a time for retreat in some areas, and a time for increased investment in areas that will guarantee future progress. Japan and Great Britain have already identified and intend to provide additional support to these same energy-related research areas.(3)(4) A number of U.S. scientific programs that involve much larger expenditures are under consideration. They show that the cost of the initiatives detailed in our statement would be modest investments, but ones directly relevant to the DOE mission.

In closing, the ACS supports a competitive, merit-based peer-review process as the primary mechanism for selection of research and instrumentation proposals for large-scale centers and facilities. The Conference Report on HUD-Independent Agencies Appropriations (H.Rpt.99-363) endorsed such a principle. It is hoped that this Subcommittee will issue a similar statement of support.

The ACS appreciates the opportunity to express its views. The Society believes that the costs of its recommendations are minimal compared to the many potential benefits derived in helping to insure a stable, long-range energy supply in the U.S. and in reducing the Nation's vulnerability to the uncertainties of foreign oil supplies.

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3. "Recommendation of the Council for Science and Technology on the 11th Inquiry titled, 'Comprehensive Fundamental Policy for Promotion of Science and Technology to Focus Current Changing Situations from the Long-term View,'" The Council for Science and Technology, Japan, November 1984.

4. "Bread and SERCuses," John Albery, Chemistry in Britain, May 1984, p. 413.

APPENDIX I

Relative Funding of Chemical Sciences Among Ten DOE Fundamental Research Programs

(operating expenses - dollars millions)

Office of Energy Research Programs	1985 Enacted (a)	Chemical Sciences Portion (b)
Fusion	$ 374.3	$ 0
High Energy Physics**	372.9	0
Biological and Environmental Research	176.1	33.7
Nuclear Physics **	146.9	7.3-14.7 (c)
Materials Sciences *	133.1	33.7
Chemical Sciences *	79.5	68.8
Nuclear Sciences *	40.4	12.2
Applied Mathematics *	35.1	0.6 (c)
Engineering and Geosciences *	26.7	5.3
Biological Energy Research *	12.5	9.8
Advanced Energy Projects *	10.6	1.3
TOTAL	$1,408.1	$171.7-179.1

* Programs funded under Basic Energy Sciences
** Programs funded under General Science and Research

a) Source: Senate Report 99-110, "Energy and Water Development Appropriation"
b) Source: DOE provided for Energy Research Advisory Board's Ad Hoc Chemistry Review Panel, January 1986. Chemical Sciences portion may contain chemistry, biochemistry, and chemical engineering. Figures may include share of operating expenses at national laboratories.
c) DOE: very rough estimate.

CHEMISTRY AND THE DEPARTMENT OF ENERGY MISSION

DOE support of the chemical sciences is embedded in a total R&D FY 1985 budget amounting to $5778M, which rose by 4.1 percent from the FY 1984 level. However, 44 percent of this is directed toward Defense R&D, which rose by 10.3 percent. When these R&D activities are subtracted, the non-Defense R&D total, $3245.9M, is found to fall slightly relative to FY 1984 (by .2 percent).

In another profile of the FY 1985 DOE R&D budget, two-thirds will be expended in the DOE National Laboratories, which, all together, saw their proposed collective budgets rise by 8.5 percent from 1984. By difference, the one-third expended outside the National Laboratories ($1889.8M) fell by 3.8 percent. A component of the difference is attributable to the concentration of the overall budget increase in Defense-related R&D, most of which is conducted in 4 or 5 of the 12 National Laboratories.

5. National Research Council, Opportunities in Chemistry, pp. 310-315.

Need for a DOE Initiative in Chemistry

With these 1984-1985 changes in mind, it is appropriate to assess the relative emphasis placed on fundamental research in chemistry by DOE in pursuit of its mission. To do so, we have listed in Table VII-11 the FY 1985 budgets of the most fundamental research programs conducted under the DOE headings "Energy Supply" and "General Science and Research." The individual programs are listed in order of size, and the last column shows the percentage of the total for those programs. The table shows that of the programs listed, the Materials Sciences represent 10.9 percent, the Chemical Sciences 5.3 percent, and the Nuclear Sciences (where Nuclear Chemistry is found) 2.5 percent.

TABLE VII-11 Magnitude of Selected DOE Fundamental Research Programs, FY 1985[a]

High energy physics[b]	$547.8M	30.7%
Magnetic fusion energy	440.1	24.7
Materials sciences[c]	193.6	10.9
Environmental sciences	191.1	10.7
Nuclear physics[b]	180.6	10.1
Chemical sciences[c]	95.1	5.3
Nuclear sciences[c]	44.0	2.5
Applied mathematical sciences[c]	36.8	2.1
Engineering and geosciences[c]	28.3	1.6
Biological energy research[c]	13.1	0.7
Advanced energy projects[c]	11.1	0.6
Total	$1781.6M	

[a] AAAS Report IX: *Research and Development, FY 1985* (following congressional action, as compiled by AAAS in Nov. 1984).
[b] Programs conducted under "General Science and Research."
[c] Programs conducted under "Basic Energy Science" within "Energy Supply."

The Materials Sciences Program devotes a modest percentage of its budget to chemistry-oriented programs (about 7 percent) including programs on Polymers (1.3 percent), Catalysis (1.9 percent), Corrosion (3.0 percent), and Combustion (.4 percent). About 9.4 percent of the Nuclear Science budget goes to support heavy-element chemistry.

One can explain the sense of urgency implicit in the very large annual investment being made in the development of nuclear fusion, an investment that has been sustained now for almost two decades. It is quite impossible, however, to rationalize the extremely modest emphasis placed on chemistry, as embodied in the 5.3 percent figure. Chemistry and Chemical Engineering will be the dominant sciences in the energy technologies that must be developed and that we will depend upon for the rest of this century. In 1983, 92 percent of the U.S. energy consumption was based upon chemical fuels. The small remainder, 8 percent of our use, was mostly provided by about equal contributions from nuclear and hydroelectric energy.

As the DOE contemplates its mission, *to assure future access to abundant and clean sources of energy*, it must reckon with these challenging expectations for the next three decades:

—by the year 2000 the U.S. annual energy consumption will probably exceed today's use by 20 to 50 percent;

—during the next three decades, growth in the use of nuclear power will be severely constrained by social concerns already in evidence;

—further increase in hydroelectric power has natural limits and is in conflict with widespread desire to minimize environmental encroachment;

—even the most optimistic proponents of nuclear fusion do not see it providing a large fraction of our energy use before well into the 21st century;

—dependence upon high-grade petroleum crudes and high-grade coal deposits must decline as worldwide reserves are depleted and as access to foreign crude oil is capriciously restricted by political developments beyond our control.

These boundary conditions surely point to the need for expanding the knowledge base upon which new energy technologies can be built. Chemical and electrochemical systems provide some of the most compact and efficient means of energy storage. And we can predict with confidence that foremost among the new energy sources will be low-grade chemical fuels, such as high-sulfur-content coal, shale oil, tar sands, peat, lignite, and biomass. For not one of these alternatives does appropriate technology exist today that can economically meet the stringent demand that environmental pollution be avoided despite the higher impurity content of these new feedstocks. Enormous chemical challenges must be met—for new catalysts, new processes, new fuels, new extraction techniques, more efficient combustion conditions, better emission controls, more sensitive environmental monitoring, and many others. Biomass must be brought to practicality to reduce the amount of fossil fuel burned and thus to help check the rate of increase in atmospheric carbon dioxide. (Combustion of biomass grown for fuel cannot return more CO_2 to the atmosphere than was consumed in the photosynthetic processes by which the biomass was produced). Solar energy must be fully exploited including through development of artificial photosynthetic and electrocatalytic techniques that avoid combustion by converting the photon energy directly to electrical or chemical energy. To accelerate our movement toward meeting these critical needs ***the Department of Energy should mount a major initiative in those areas of chemistry relevant to the energy technologies of the future.*** The same urgency that justifies our powerful program in nuclear fusion dictates a program of comparable magnitude in chemistry. The scope of the initiative should be broad, encompassing all forms of catalysis (homogeneous, heterogeneous, electro-, photo-, and enzymatic-catalysis), exploiting the new potentialities for understanding combustion, developing the plant sciences that will facilitate our use of natural photosynthesis, and adventuring boldly into frontiers that may open new energy avenues (genetic engineering of photosynthetic organisms, development of polymeric photovoltaic devices, etc.). The program should take full advantage of the multidisciplinary capabilities of our National Laboratories. Although its funding is set at a modest level, the Combustion Research Facility at Sandia

Livermore provides a laudable example. *In an appropriate number of our National Laboratories, the defined mission should be reshaped to include a major focus on one or more of the areas of chemistry crucial to energy technologies.* And, most important, the DOE research support to universities must be increased to engage the larger chemistry community in the accomplishment of the Department's mission. While the chemistry activity at the National Laboratories is being increased, *university research programs in energy-relevant areas of chemistry should be raised to be commensurate with those in the National Laboratories. In addition, the interaction between DOE laboratories and universities should be strengthened through visiting faculty researcher programs and long-term collaborative projects.*

A Proposed 5-Year Initiative

A program to approach these goals in a cost-effective way is presented in Table VII-12. It proposes to build toward a level of commitment about half as big

TABLE VII-12 A Proposed 5-Year DOE Initiative in Chemistry (All in FY 1985 Dollars)

	Biological Energy + Chemical Sciences + Catalysis + Combustion	Incremental Growth	National Labs	Universities
FY 1985	$120M	$—	$ 94M	$ 26M
1986	142M	+22M	101M	41M
1987	169M	+27M	110M	59M
1988	201M	+32M	121M	80M
1989	239M	+38M	134M	105M
1990	285M	+46M	149M	136M
Total growth over 5 years		$165M		

as that for magnetic fusion, appropriate to the reality that 90 percent of our energy must come from chemical energy sources for the next quarter-century. *Incremental growth by a factor of about 2.5 is needed in chemistry research programs relevant to the DOE mission.* This level of effort should be roughly equally divided between the National Laboratories and university laboratories. The substantial growth implied is approached over a 5-year period at a real growth rate of 20 percent per year for 5 years to ensure cost-effective distribution of the incremental resources and to provide orderly growth of the DOE program management expertise that will be needed. Each yearly increment in this 5-year program would be divided in a growth pattern that will, first, stimulate the efforts of those National Laboratories that choose to refocus their defined mission toward chemistry-based energy technologies and, second, build the engagement of the academic research community in the areas that undergird these technologies. The FY 1985 baseline is taken to be $120M, based upon the approximate present sum of the Chemical Sciences, the Biological

Energy Research, and the Catalysis, Corrosion, and Combustion programs.

This initiative is intended to be broad in scope to encompass the range of chemistry frontiers at which advances can be expected and which are obviously of relevance to the development of new energy technologies. A desirable distribution of the incremental resources is given in Table VII-13.

TABLE VII-13 A Desirable Deployment of Incremental Resources (All in FY 1985 Dollars)

	1986	1987	1988	1989	1990	5-Year Program Growth
Catalysis						
Heterogeneous	$ 6M	$+6M	$+7M	$+8M	$+10M	$+37M
Homogeneous	+2M	+3M	+4M	+5M	+6M	+20M
Enzymes and artificial enzymes	+2M	+3M	+4M	+5M	+6M	+20M
Electrocatalysis	+3M	+4M	+4M	+5M	+6M	+22M
Reaction dynamics	+3M	+4M	+5M	+6M	+7M	+25M
Photosynthesis and photochemistry	+3M	+4M	+4M	+5M	+6M	+22M
Plant sciences	+3M	+3M	+4M	+4M	+5M	+19M
Increment	$22M	$27M	$32M	$38M	$46M	$165M

Technical Qualifications at the DOE National Laboratories

In light of our recommendation that the DOE mount an initiative in support of chemistry-based energy technologies, it is useful to ask about the distribution of technical qualifications of the scientific staffs at the existing National Laboratories. Furthermore, changes over the last decade in professional qualifications at each of the National Laboratories may indicate changing trends in the way each Laboratory sees its mission evolving. Table VII-14 shows for four National Laboratories the number of physicists and of chemists in 1970, 1980, and 1984. In assessing these figures, it is perhaps relevant to remember that U.S. business employs approximately 2.5 times more Ph.D. chemists than Ph.D. physicists.

The ratios shown in the last column of Table VII-14 are revealing. The only trend discernible is at Oak Ridge where the hiring pattern must reflect a deliberate movement away from chemistry-based technologies. At Argonne and Brookhaven, the hiring pattern seems to signal a general laboratory expansion over the 1970s followed by a retreat or slowdown in growth. However, in neither laboratory is there evidence of significant change toward chemistry-based mission goals. For Los Alamos only current data were available, and they display heavy emphasis on physics-oriented goals. These compositions imply leanings away from chemistry-based technologies, an outcome more or less dictated by and appropriate to the distribution of DOE research resources presented in Table VII-11. The program advocated in Table VII-12 projects an

TABLE VII-14 Distribution of Chemists and Physicists at the DOE National Laboratories

National Laboratory	Year	Number of Ph.D. Physicists		Professionals Chemists		Number of Physicists / Number of Chemists
Argonne	1971	168		128		1.31
	1980	191	+23	159	+31	1.20
	1984	169	−22	132	−27	1.28
Oak Ridge	1970	178		180		.99
	1980	250	+72	176	−4	1.42
	1983	269	+19	166	−10	1.62
Brookhaven	1970	200		82		2.50
	1980	260	+60	133	+51	1.95
	1984	276	+16	134	+1	2.06
Los Alamos	1984	679		242		2.81

overall growth by about 65 percent of the chemistry-oriented research activity at the National Laboratories. It is recommended that ***growth in chemistry-oriented research should be concentrated at those National Laboratories that choose to refocus their defined mission toward chemistry-based energy technologies. This growth should add substantially to the cadre of Ph.D. staff with credentials in areas of chemistry appropriate to the new mission.***

WEDNESDAY, APRIL 9, 1986.

BIOFUELS PROGRAM

WITNESS

DONALD KLASS, PRESIDENT, BIOMASS ENERGY RESEARCH ASSOCIATION

Mr. BEVILL. Dr. Klass. We are pleased to hear from you, Doctor, and your prepared statement will be made part of the record.

Dr. KLASS. Thank you, Mr. Chairman, and members of the subcommittee.

My name is Donald Klass, and I am President of the Biomass Energy Research Association or BERA.

It is a non-profit organization that was founded in 1982 by biofuels researchers to promote education and research related to the development of biomass energy systems, and to serve as a source of information on biomass policies and programs for our members and industry.

First, let me take a moment to commend the subcommittee for the recognition it has given biofuels research in recent years. Certainly, you have recognized the unique qualities and contributions of biofuels technology. For example, these technologies: provide domestic, renewable substitutes for fossil-derived liquid, gaseous, and solid fuels, as well as electricity by application of suitable conversion processes; contribute about 3 percent to the Nation's primary energy demand with wood fuels—1.2 million BOE/d—electric power from municipal solid waste combustion plants—8,200 BOE/d—and methane from municipal solid waste landfills.

This contribution remains in this country even at a price of $10 per barrel of oil about $4.5 billion per year that is not expended on imported energy.

Biofuels provided excellent regional benefits also. Eighty cents of every dollar spent on biofuels in a given region stays in that region while 80 cents of every dollar spent on petroleum leaves the region open.

Finally, they create local jobs and income such as, for example, the 65,300 jobs and $1.3 billion in income in the Northeast that result from wood energy utilization.

Clearly with relatively modest amounts of Federal research support, especially in comparison to other technologies, biofuels are making a significant contribution to the Nation's energy supply. Further, biofuels technology is applicable to the special needs of every region of the Nation.

However, technological barriers remain before advanced biofuels systems can be utilized. These must be addressed with continuing Federal support of basic and high-risk research and development because biofuels technologies are the only ones capable of providing energy in all its forms to all our citizens without concern for resource depletion, import problems, and environmental safety.

These highlights demonstrate the substantial benefits to be achieved through continued biofuels research and development. However, new capabilities such as the fermentation of lignocellulosic materials—wood and crop residues—to produce low-cost ethanol

fuels, the production of medium-Btu gas at low cost, and the entrained pyrolysis of biomass to produce oil products, offer the potential for enormously increasing the versatility and ultimate scale of biofuels technology in the United States.

At the same time, these innovations present complex technical challenges that require the resolution of many problems. It is particularly appropriate that the Federal biofuels R&D program continue to maintain funding of biofuels for long-term, potentially high pay-off technologies.

Before I describe BERA's recommended by 1987 funding priorities, let me take a moment to express some concerns that our membership has regarding the Department of Energy's biofuels program.

First, our recommendations emphasize the need for continuity of funding research in thermochemical and biochemical conversion. Answering fundamental questions about how various biomass fuels can be processed and efficiently converted is the keystone to a sound program to develop advanced biofuels systems.

Yet, this part of the program we believe has been disproportionately reduced over the last few budget seasons relative to other program elements. In March, the House Subcommittee on Energy Development and Applications of the Committee on Science and Technology reported an authorization budget of $24.1 million for biofuels programs. The subcommittee recognized the importance of conversion technologies by including within this total, $9.2 million for thermochemical conversion and $7.1 million for biochemical conversion. We trust the subcommittee will take this factor into consideration during its deliberations.

Now, I would like to highlight for the subcommittee some of the key aspects of our recommendations.

The thermochemical conversion program has made substantial strides towards its objectives and is just now entering the phase when innovations at the bench scale are being consolidated into meaningful technologies.

Reductions in the program at this time would prevent the consolidation of many of these gains. BERA's members engaged in thermochemical conversion research are alarmed at the large reduction in funding for research activities that the program has already experienced.

Research should be continued to develop innovative advanced gasification processes for the economic and reliable production of gaseous fuels from both biomass and municipal solid wastes.

Although BERA supports funding for prototype testing—on a cost-shared basis with industry—such testing should not detract from maintaining a vigorous thermochemical conversion program component.

Progress has also been made in achieving high yields of substitute fuel oils through the optimization of pyrolysis conditions for maximizing liquid yields. Research and development efforts should continue to improve oil yield and to quantify oil product combustion and storage characteristics.

Overall, BERA recommends $8,900,000 be directed to continue thermochemical conversion research in fiscal year 1987.

Bioconversion research has concentrated on the development of technology for the economical use of our vast lignocellulosic resources as feedstocks for fermentation and other bioconversion processes. The resistance of lignocellulose to biological attack and its multi-component make-up continue to present many difficult R&D challenges.

The Federal biofuels program should continue to address the problems of feedstock pretreatment, sugar recovery and fermentation, byproduct recovery and applications development, and wastewater controls. An assessment of biofuels technologies conducted in 1985 rated lignocellulose bioconversion technology as the foremost development need. Again, progress to date is just reaching the point where individual advances in the laboratory are being consolidated into meaningful processes.

BERA recommends that $6,800,000 be directed to continue bioconversion research.

Biomass production technology development by the biofuels program provides a much needed orientation of cultivation strategies to produce high-yield, low-cost biomass feedstocks. Short-rotation intensive culture tree growth offers a unique way to produce large amounts of woody biomass over shorter periods of time for energy applications.

Herbaceous biomass development offers high-yielding energy crops with major soil conservation benefits and new opportunities for the farmer.

BERA recommends that $5,200,000 be directed to continue biomass production research.

Since the regional programs were instituted three years ago, they have proven extremely valuable in facilitating the transfer of technology to the private sectors in their respective regions. Feedback through the regional programs has also proven beneficial in the fine tuning of the mission-oriented research programs, and has better communicated the utility of the biofuels program to those at the grass roots level.

BERA recommends that $2.5 million be directed to continue the regional programs.

One final consideration in presenting a biofuels budget is the recognition of the challenge to the biofuels program management as a consequence of the consolidation of several previously autonomous programs into a single biofuels program. Although the consolidated biofuels program has strived to sustain the original objectives of the separate programs, it is obliged to do so within the constraints of a steadily reduced budget. Thus, the critical mass of individual research initiatives is challenged by both a declining budget and an increase in the total number of research activities. To help overcome these difficulties and sustain an innovative program, BERA recommends a budget of $23.4 million for biofuels technology for fiscal year 1987.

The Department of Energy Office of Conservation and Renewable Energy published an evaluation in 1985 to estimate the potential payoff of renewable energy options including biofuels, prioritize R&D objectives over the next five years, and identify the Federal Government's role in accomplishing these objectives.

This type of comprehensive analysis is extremely important, so much so that BERA recommends that this process be an ongoing one and that the results be applied to the makeup of the biofuels program to maximize the Nation's return on this investment. The formulation of a detailed five-year plan which is updated on an annual basis and its critical review are strongly recommended.

I appreciate the opportunity to appear before you today. If you have any questions, I would be happy to answer them now or later in writing.

Mr. BEVILL. Thank you for a very fine statement.

[The statement of Mr. Klass follows:]

Statement by Dr. Donald L. Klass, President
Biomass Energy Research Association
Before the House Committee on Appropriations
Subcommittee on Energy and Water Development
Hearing on Department of Energy FY 1987 Budget Appropriations

April 9, 1986

This testimony pertains to the Department of Energy R&D Appropriations. BERA recommends that $23.4 million be provided for Biofuels R&D, with the funds allocated in the following fashion:

Biomass Production Research	$ 5,200,000
Conversion Research	
Thermochemical (including MSW)	8,900,000
Biochemical (including alcohol fuels)	6,800,000
Regional Programs	2,500,000
Total	$23,400,000

Thank you Mr. Chairman and members of the Subcommittee.

My name is Donald L. Klass and I am President of the Biomass Energy Research Association (BERA). BERA is a non-profit association that was founded in 1982 by biofuels researchers to promote education and research related to the development of biomass energy systems, and to serve as a source of information on biomass policies and programs for our members and industry.

Each year, as we prepare to comment on the federal role in supporting biofuels research, we survey our members' views on the needs for research and development. These comments are directly reflected in the recommendations we are presenting today.

First let me take a moment to commend the Subcommittee for the recognition it has given biofuels research in recent years. Certainly, you have recognized the unique qualities and contributions of biofuels technology. For example, these technologies:

- Provide domestic, renewable substitutes for fossil-derived liquid, gaseous, and solid fuels, as well as electricity, by application of suitable conversion processes.
- Contribute about 3% to the Nation's primary energy demand with wood fuels (1.2 million BOE/d), octane-enhancing alcohol fuels in alcohol-gasoline blends (32,000 BOE/d), electric power from municipal solid waste combustion plants (8,200 BOE/d) and methane from municipal solid waste landfills (2,400 BOE/d).
- Retain in this country, even at a price of $10 per barrel of oil, about $4.5 billion per year that is not expended on imported energy.
- Provide excellent regional benefits — 80 cents of every dollar spent on biofuels in a given region stays in that region, while 80 cents of every dollar spent on petroleum leaves the region.

- Create local jobs and income such as, for example, the 65,300 jobs and $1.3 billion in income in the Northeast that result from wood energy utilization.

Clearly with relatively modest amounts of federal research support, especially in comparison to other technologies, biofuels are making a significant contribution to the Nation's energy supply. Further, biofuels technology is applicable to the special needs of every region of the Nation.

However, technological barriers remain before advanced biofuels systems can be utilized. These must be addressed with continuing federal support of basic and high-risk research and development because biofuels technologies are the only ones capable of providing energy in all its forms to all our citizens without concern for resource depletion, import problems, and environmental safety.

These highlights demonstrate the substantial benefits to be achieved through continued biofuels research and development. However, new capabilities such as the fermentation of lignocellulosic materials (wood and crop residues) to produce low-cost ethanol fuels, the production of medium-Btu gas at low cost, and the entrained pyrolysis of biomass to produce oil products, offer the potential for enormously increasing the versatility and ultimate scale of biofuels technology in the United States. At the same time, these innovations present complex technical challenges that require the resolution of many problems. It is particularly appropriate that the federal biofuels R&D program continue to maintain funding of biofuels for long-term, potentially high pay-off technologies.

BERA RECOMMENDATIONS

Before I describe BERA's recommended FY1987 funding priorities, let me take a moment to express some concerns that our membership has regarding the Department of Energy's biofuels program.

First our recommendations emphasize the need for continuity of funding research in thermochemical and biochemical conversion. Answering fundamental questions about how various biomass fuels can be processed and efficiently converted is the keystone to a sound program to develop advanced biofuels systems. Yet, this part of the program we believe, has been disproportionately reduced over the last few budget seasons relative to other program elements. In March, the House Subcommittee on Energy Development and Applications of the Committee on Science and Technology reported an authorization budget of $24.1 million for biofuels programs. The Subcommittee recognized the importance of conversion technologies by including within this total, $9.2 million for thermochemical conversion and $7.1 million for biochemical conversion. We trust the Subcommittee will take this factor into consideration during its deliberations.

Now, I would like to highlight for the Subcommittee some of the key aspects of our recommendations.

Thermochemical Conversion

The thermochemical conversion program has made substantial strides towards its objectives and is just now entering the phase when innovations at

the bench scale are being consolidated into meaningful technologies. Reductions in the program at this time would prevent the consolidation of many of these gains. BERA's members engaged in thermochemical conversion research are alarmed at the large reduction in funding for research activities that the program has already experienced.

Research should be continued to develop innovative advanced gasification processes for the economic and reliable production of gaseous fuels from both biomass and municipal solid wastes. Progress has been made on optimization of reactor designs and operating conditions to maximize the desired products. More research is needed to evaluate feedstock conversion characteristics and requirements. Continuing research should also address problems associated with the feeding of solids at high pressures and recycling to improve carbon conversion and to reduce environmental problems.

Although BERA supports funding for prototype testing (on a cost-shared basis with industry), such testing should not detract from maintaining a vigorous thermochemical conversion program component.

Progress has also been made in achieving high yields of substitute fuel oils through the optimization of pyrolysis conditions for maximizing liquid yields. Research and development efforts should continue to improve oil yield and to quantify oil product combustion and storage characteristics.

Overall, BERA recommends $8,900,000 be directed to continue thermochemical conversion research in FY87.

Bioconversion

Bioconversion research has concentrated on the development of technology for the economical use of our vast lignocellulosic resources as feedstocks for fermentation and other bioconversion processes. The resistance of lignocellulose to biological attack and its multi-component make-up continue to present many difficult R&D challenges. The federal biofuels program should continue to address the problems of feedstock pretreatment, sugar recovery and fermentation, by-product recovery and applications development, and wastewater controls. An assessment of biofuels technologies conducted in 1985 rated lignocellulose bioconversion technology as the foremost development need. Again, progress to date is just reaching the point where individual advances in the laboratory are being consolidated into meaningful processes.

BERA recommends that $6,800,000 be directed to continue bioconversion research.

Biomass Production

Biomass production technology development by the biofuels program provides a much needed orientation of cultivation strategies to produce high-yield, low-cost biomass feedstocks. Short-rotation intensive culture tree growth offers a unique way to produce large amounts of woody biomass over shorter periods of time for energy applications. Herbaceous biomass development offers high-yielding energy crops with major soil conservation benefits and new opportunities for the farmer. Aquatic biomass production has proven very constructive as a treatment method for municipal sewage and simultaneous feedstock production. It also has the potential of providing new ways to produce liquid fuels.

BERA recommends that $5,200,000 be directed to continue biomass production research.

Regional Programs

Since the regional programs were instituted three years ago, they have proven extremely valuable in facilitating the transfer of technology to the private sectors in their respective regions. Feedback through the regional programs has also proven beneficial in the fine tuning of the mission-oriented research programs, and has better communicated the utility of the biofuels program to those at the grass roots level. BERA believes the biofuels program can benefit substantially by enhanced communication with universities, industry, and the community of prospective biofuels end-users. The December 1985 report released by the Energy Research Advisory Board also supports keeping a broad base of participation, especially with universities and industry, in the solar and renewable programs.

BERA recommends that $2,500,000 be directed to continue the regional programs.

Recommended Budget

One final consideration in presenting a biofuels budget is the recognition of the challenge to the biofuels program management as a consequence of the consolidation of several previously autonomous programs into a single biofuels program. Although the consolidated biofuels program has strived to sustain the original objectives of the separate programs, it is obliged to do so within the constraints of a steadily reduced budget. Thus, the "critical mass" of individual research initiatives is challenged by both a declining budget and an increase in the total number of research activities. To help overcome these difficulties and sustain an innovative program, BERA recommends a budget of $23.4 million for biofuels technology for FY 1987:

Biomass Production Research	$ 5,200,000
Conversion Research	
Thermochemical (including MSW)	8,900,000
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Total	$23,400,000

Program Evaluation

The Department of Energy Office of Conservation and Renewable Energy published an evaluation in 1985 to estimate the potential payoff of renewable energy options including biofuels, prioritize R&D objectives over the next 5 years, and identify the Federal Government's role in accomplishing these objectives. This type of comprehensive analysis is extremely important, so much so that BERA recommends that this process be an on-going one and that the results be applied to the makeup of the biofuels program to maximize the Nation's return on this investment. The formulation of a detailed 5-year plan which is updated on an annual basis and its critical review are strongly recommended.

I appreciate the opportunity to appear before you today on behalf of BERA and would be happy to answer any questions you may have now, or later in writing.

TESTIMONY FOR HOUSE SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

HOUSE COMMITTEE ON APPROPRIATIONS

April 9, 1986

BIOFUELS ENERGY SYSTEMS

D. J. O'Neil, PhD and H. O. Spauschus, PhD
Energy and Materials Sciences Laboratory
Georgia Tech Research Institute
Georgia Institute of Technology
Atlanta, Georgia 30332

The Georgia Institute of Technology,an established leader in bioenergy and biomass conversion research, since well before the 1970 oil crises is intimately involved with virtually every aspect of modern biomass technology development (alcohol fuels, pyrolysis, gasification, anaerobic digestion, etc.) with private industry, university and government laboratories, and with the international community.

GIT views with great concern the continued erosion of federal funding for USDOE's Biofuels Energy Systems. It views the proposed FY'87 level of $12.2M, a reduction from a previous low in FY'86 of $27.3M, to be indefensible. It effectively represents a cessation of any serious attempt to meet future energy requirements from an abundant renewable resource, one which already contributes substantially to national energy demands.

GIT urges that the proposed budget be rejected and endorses a return to a funding level which, as a minimum, equates with FY'86 levels, a level which it considers to be already reflective of and responsive to the national economic constraints.

It is the firm belief of the Georgia Institute of Technology that the reduction of the USDOE biofuels energy systems budget to a proposed 12.2M for FY'87 will:

(1) decimate the already-depleted university research programs

(2) isolate "research" activities in one or two national laboratories.

(3) dismantle and disperse core teams of veteran biomass researchers and technologists

(4) eliminate the training and education of students in

preparation for an emerging technology and industry

(5) drive committed U.S. researchers and industrial technology to seek foreign research and commercial development support

(6) surrender previously-funded market and technology leads to foreign competitors

(7) prevent the development of a viable U.S. biomass and bioenergy industry now or in the future

GIT urges not only an increase in research funds but also a redistribution in research fund allocations to redress the serious deficiency in support of university-based research, a general condition cited in the December 1985 report of the Solar Panel of the Energy Research Advisory Board (ERAB) to USDOE (Report DOE/S-0039).

As a specific example of the disproportionate cutbacks in university R & D support, from a FY'86 budget line item of $11,500,000 apparently for "thermochemical conversion" research, as of this month only a reported $2,400,000 will manage to trickle down for support of biomass thermochemical conversion research by universities and national laboratory researchers.

The ERAB Solar Panel states;

> "Reasonable diversity in laboratory participation in research, along with continuation or even increases in the base of university and industry research activities, must be maintained ---"

To meet that recommendation for biofuels energy research, funding will have to be maintained, university participation will

have to be more directly managed from one central coordinating source, large money-gobbling demonstration projects will have to be deferred or conducted, as effectively shown, through Regional Biomass Programs and their cost-sharing approaches.

We concur with another recent Energy Research Advisory Board (DOE/S-0046, 12/85) that USDOE's civilian R & D programs, which include both basic sciences and energy technology, are long-term investments which must be protected and supported to provide the Nation with the ability to deal with an uncertain energy future. As the report states;

> "--- essentially all projections of future of energy markets, including those of DOE, indicate that by the year 2000 there will be substantial increases in petroleum imports and significant real escalation in prices".

"Goal-directed programs", which have consistently been able to achieve DOE-specified research evaluation criteria such as development of entrained pyrolysis oil production for petroleum substitution, "must be keep immune from short-term swings in oil supply and demand."

Finally, GIT in harmony with its mission to contribute to the economic development of the nation, and its demonstrated ability to nurture biomass research through commercialization by the private sector, endorses a policy of participation by industry in the transfer of government-supported technology to that sector. However, this same experience leads us to exhort the government to recognize that emerging industries, like emerging technologies, will require strong government funded support in the early stages.

WEDNESDAY, APRIL 9, 1986.

WIND ENERGY PROGRAM

WITNESS

THOMAS O. GRAY, EXECUTIVE DIRECTOR, AMERICAN WIND ENERGY ASSOCIATION

Mr. BEVILL. Mr. Thomas Gray. You may proceed as you wish, Mr. Gray.

Mr. GRAY. Thank you, Mr. Chairman, Congressman Myers.

My name is Tom Gray. I am Executive Director of the American Wind Energy Association and we, like many others here today, appreciate the opportunity to testify.

Our trade association represents the manufacturers of wind electric turbines and their components. We have about 250 companies which are members but most of those are very small companies.

We have a few large ones—Boeing is a member of our association, but most of them have fewer than ten employees. My testimony today I really just have a few major points I want to leave with you.

I know the time is short as so many others have mentioned. First of all, our industry has grown and matured very dramatically over the last five years. In 1981, the wind farms in the United States generated less than enough energy to meet the needs—the electrical needs of two average homes.

Last year they produced enough to serve the needs of 100,000 average households. So that is a very large growth in four years.

As I am sure you know, it is based largely on the tax incentives that have been provided by the Federal Government and on PURPA, and other wind energy research programs.

Also, at the same time I am pleased to report that the wind electric turbines that are in the field have shown a steady increase in reliability and performance.

Pacific Gas and Electric which is the largest IOU in the United States did a study of several thousand wind machines in Altamont Pass recently. That study showed that the average wind machine last year produced about six times as much power as the average machine produced in 1982. So at the same time we are putting more machines in the field, we are realizing a very much improved performance from those machines.

Our industry—I guess I feel like we have kind of been on a rocket going up towards a cliff and we are about at the end of the cliff today. We are going to find out whether we have enough thrust to keep on going or whether we are going to be heading downward.

We have run into a series of economic forces beyond our control and that leaves our future very uncertain. The Federal energy tax credits expire December 31. We expected that. We did not expect that the investment tax credit was going to expire at the same time and that the depreciation for wind turbines was going to be stretched out as well.

That has put our financial environment of our industry in real jeopardy. Oil prices have been dropping as many other witnesses have mentioned.

We are concerned about the possibility of attempts to restrict PURPA during this present session of Congress and that would be very damaging to us also and finally, as we all know, for reasons of budgetary constraints, the Federal wind program has been cut back. That is happening at the same time that Denmark, for example, which is our chief competitor in the world market, is increasing its subsidies for its domestic wind industry and the Netherlands, another competitor, has announced plans to buy large numbers of wind systems from its private industry to stimulate their commercial growth.

In part, we are in the position we are in today because it was originally conceived by the Department of Energy and by many in private industry that to build a good wind system all you had to do was simply take some of the advances that had taken place in aerospace technology, put them up on a pole and you would have a heck of a wind machine.

That is probably going to be true, but it isn't quite true yet. We have had very difficult problems with our designs. The force of the wind acting on these turbines has been much stronger than anybody imagined it would be.

We had a lot of failures and the Danes have gone to a beefy tractor type approach and they have done very well with it. The fact of the matter is last year about half of the wind systems installed in the United States were foreign.

This year we think that will rise to over 70 percent. Basically we feel this is not the year to cut the wind program by two-thirds which is what the Administration is proposing.

We have about four program initiatives we consider of particular importance. Number one is the cooperative field test program in which the Department tests wind farm turbines in the field on a cost share basis with private companies to try to find out about research objectives.

That is a very good program. When they put out the first RFP for that program they got many more proposals than they could fund and we would like to see that program expanded. We would also like to see a cooperative research program that would aim at some of the problems, for example, in development of advanced materials that you don't get by field testing.

These are things that have to have some lab research done. Again, we would like to see a cost shared program pursued. The Department has also begun a modest wind diesel effort. We would like to see that expanded.

Several of our competitors in Europe are pursuing wind diesel research programs. That is probably the single largest near-term international market and we can't afford to get behind in developing it.

Finally, we support, as I think the committee does, the subcommittee does, finishing and testing the MOD–5 advanced multimegawatt wind system. This machine is fully manufactured and its installation has begun and its testing should be completed.

The Administration proposal provides no fund for this purpose. I guess I would like to just conclude, Mr. Chairman, by, as so many others have today, thanking you and members of this subcommittee, for your continued support for renewable energy over the past several years. The progress our technology has been made due in large measure to that support and we thank you for it.

Mr. BEVILL. Thank you. We appreciate your fine statement and we will do what we can to work with you. Thank you very much.

[The statement of Mr. Gray follows:]

AWEA Wind Research Budget Recommendations
April 14, 1986

The following statement provides recommendations of the American Wind Energy Association for the FY 1987 federal wind energy research budget. Two AWEA numbers are presented for each funding category. The first, entitled "AWEA Constrained," envisions a wind budget totalling $17.5 million. The second, entitled "AWEA Preferred," adds to a total of $20.5 million.

Atmospheric Fluid Dynamics

Administration Request:	$1.0
AWEA Constrained:	1.0
AWEA Preferred:	2.0

Our understanding of the behavior of the wind is still essentially primitive, particularly in the areas which the Administration identifies (Microscale Turbulence, Local Flow and Performance Variability). These are extremely complex areas and better knowledge of them is important to better wind system performance and durability.

Many times the amounts listed could fruitfully be spent on this category. Each windfarm development area is quite different from the others, and the windfarm locations within each development area are actually unique. AWEA would prefer to see more funds made available for this problems if possible.

Aerodynamics

Administration Request:	$2.0 (includes 1.0 for CFTP)
AWEA Constrained:	4.0 (includes 3.0 for CFTP)
AWEA Preferred:	4.0 (includes 3.0 for CFTP)

SERI is doing some good work in this area, particularly on development of new high-performance airfoils which are less sensitive to surface degradation.

AWEA is very interested in expanding the Cooperative Field Test Program (CFTP), under which windfarm machines are tested in the field in support of research objectives. Since this program requires DOE to work directly with the industry, it helps to ensure that there is an active exchange of information between the industry and federal researchers -- something that is important to both.

The first RFP issued under the CFTP brought in many more proposals than could be funded. There is active industry interest in this program and in the concept of cost-shared research, and it should be expanded as much as possible.

Structural Dynamics

Administration Request:	$2.5
AWEA Constrained:	1.5
AWEA Preferred:	2.0

Structural dynamics are a key research area for developing an understanding of the behavior of wind turbines in the field and preventing structural failures. However, AWEA believes these issues can be addressed more directly through an expanded CFTP and an expanded university research program, and that is what we recommend.

We also recommend establishment of a Design Assistance Center, under which data and expertise in structural dynamics, which is a relatively arcane field, could be assembled and made available to industry, perhaps on a fee basis. It should be possible to fund such a center under the funding levels recommended.

Advanced Component Research

Administration Request:	$1.5
AWEA Constrained:	1.0
AWEA Preferred:	1.5

Again, much of this work can be accomplished through an expanded university research program.

AWEA also recommends establishment of a Cooperative Research Program (CRP) with initial funding of $1.0 million under this category, to pursue research objectives on a cost-shared basis with industry. The CRP would look more closely at problems such as advanced materials issues that are not readily susceptible to field testing.

Supporting Research

Administration Request:	$1.0
AWEA Constrained:	3.35
AWEA Preferred:	3.35

This funding category includes two items which AWEA feels strongly about -- wind/diesel research and voluntary consensus standards development.

Wind/diesel hybrid applications are expected to be the largest near-term international market for wind energy systems, and other countries are moving forward with aggressive programs. SERI's recently-begun wind/diesel initiative should be expanded.

Standards are becoming increasingly important for the industry, as local and state regulatory agencies exert more and more control. AWEA is working cooperatively on standards development

with DOE, and $350,000 is provided for this activity.

University Research

Administration Request:	$-0-
AWEA Constrained:	2.0
AWEA Preferred:	3.0

SERI has recently begun to fund some university research efforts, and AWEA believes this program should be expanded. The future progress of this technology depends heavily upon the development of an experienced and knowledgeable body of engineers, and the best university programs of the past have ended as federal funding has dried up.

MOD-5 Testing

Administration Request:	$-0-
AWEA Constrained:	4.5
AWEA Preferred:	4.5

As our testimony indicated, AWEA does not feel that it makes sense to abandon a $60 million program within $5 million of completion. We support completion and testing of the MOD-5B provided no more than $5 million is needed for the task.

Capital Equipment

Administration Request:	$0.15
AWEA Constrained:	0.15
AWEA Preferred:	0.15

Total Program Funding:

Administration Request:	$8.25
AWEA Constrained:	17.5
AWEA Preferred:	20.5

WEDNESDAY, APRIL 9, 1986.

BIOMASS PROGRAM

WITNESS

MIKE BALY, VICE PRESIDENT FOR GOVERNMENT AFFAIRS, AMERICAN GAS ASSOCIATION

Mr. BEVILL. Mr. Mike Baly.

Mr. BALY. Mr. Chairman, I am Vice President of the Government Relations for the American Gas Association. The regulated gas industry recognizes the constraints that you have on Federal spending resulting from the Gramm-Rudman-Hollings bill, and in line with that, we have reviewed our priorities for federally sponsored gas R&D and we recommend a total appropriation of $156 million for all DOE natural gas related R&D, which is 22 percent below last year's request and we recommend appropriation of $68 million for projects under the jurisdiction of your subcommittee.

We recommend a strong Federal commitment to gas related research because natural gas is becoming an increasingly more vital source of energy for the U.S. economy accounting for 24 percent of all the primary energy consumed and we expect that to rise.

Gas supplies are plentiful. You are certainly aware, Mr. Chairman, the Mobile Bay off the coast of Alabama is one of the most promising exploration areas in the world. It could prove to be one of the largest gas discoveries in the U.S. since the Prudhoe Bay discovery close to 20 years ago.

We estimate that with foreseeable technology and economics, the U.S. has about 57 years of gas supplies for the conventional sources. With Federal assistance, the gas industry would be able to develop the technology necessary to recover several thousand years of natural gas which is currently unrecoverable.

Natural gas has many pluses. It is the cleanest of all fossil fuels and emits virtually no sulphur dioxide or particulate matter and far fewer nitrogen oxides, nonmethane hydrocarbons and carbon monoxide than either coal or oil.

We are confused why in the Drew Lewis report natural gas was mentioned only once in relation to what our neighbor Canada is doing in conjunction with burning gas with other fuels yet the report recommends $5 billion in clean coal technology without considering the contribution that natural gas could make.

So with your help, research enabling greater use of gas we feel would help clean up the environment. Despite these advantages, the Department of Energy reluctantly invests relatively few of its research dollars to ensure that the Nation will have long-term gas supplies to meet long-term needs.

Research in geology, geophysics and the geochemical industry, such as research Sweden, Russia and other countries are doing, we feel is necessary to increase our basic understanding of the formation and recovery of unconventional gas resources.

To achieve future technological development in this area, we request that your subcommittee earmark $35 million within the DOE $450 million basic energy sciences program for basic geoscience re-

search. This money would be used to train young men and women in the geosciences field.

This approach was strongly supported by the Interstate Oil Impact Commission which includes States such as Indiana, Alabama, Oklahoma and others.

We also recommend $11 million for geo-pressured methane research to develop new approaches that utilize traditional engineering principles to maximize gas production and minimize brine production.

We suggest $18 million for biomass and waste conversion. The supply of organic and waste materials is virtually unlimited and can add significantly to the future, total future gas supply picture.

The other recommendation that we make, Mr. Chairman, is $4 million to continue research for liquified gaseous fuels test facility to test the spills of liquified natural gas. Let me thank you for the cooperation we have had with the subcommittee and look forward to it continuing in the future.

Mr. BEVILL. Thank you for a very fine presentation.

[The statement of Mr. Baly follows:]

TESTIMONY OF MICHAEL BALY III
VICE PRESIDENT, GOVERNMENT RELATIONS
AMERICAN GAS ASSOCIATION
BEFORE THE
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT
COMMITTEE ON APPROPRIATIONS
UNITED STATES HOUSE OF REPRESENTATIVES
ON THE FY 1987 DEPARTMENT OF ENERGY
RESEARCH AND DEVELOPMENT BUDGET

April 9, 1986

Mr. Chairman and Members of the Subcommittee: I am Michael Baly III, Vice President of Government Relations for the American Gas Association (A.G.A.). I am pleased to appear before you in support of natural gas-related research and development (R&D) conducted or sponsored by the Department of Energy (DOE).

A.G.A. is a national trade association consisting of nearly 300 natural gas distribution and transmission companies that serve more than 166 million consumers in all 50 states. Collectively, these companies comprise nearly 85 percent of all gas utility sales in the United States.

In recognition of the constraints on Federal spending resulting from Gramm-Rudman-Hollings, the gas industry has reconsidered its priorities for federally-sponsored gas R&D. Accordingly, A.G.A. recommends an appropriation of $156 million for all DOE natural gas-related R&D in FY 1987. Our total FY 1987 recommendation reduces by 22 percent A.G.A.'s FY 1986 recommendation of $200 million. From this total, we recommend an appropriation of $66 million for projects under the jurisdiction of this Subcommittee. We consider this reduced level of funding for total gas research in FY 1987 to be the minimal necessary to develop and utilize future natural gas resources to their fullest potential.

SUMMARY OF RECOMMENDATIONS

$35 Million . . . . . Basic Geosciences Research
$11 Million . . . . . Geopressured Methane
$ 2 Million . . . . . Liquefied Natural Gas Safety
$18 Million . . . . . Biomass

DOE FUNDING FOR GAS AND GEOSCIENCES RESEARCH

Natural gas is a vital source of energy for the United States economy. For example, in 1985, estimates indicate that gas accounted for 24 percent of the primary energy consumed in the United States. Indeed, over the past 25 years, natural gas has accounted for between 24 and 33 percent of all of the primary energy consumed in the United

States. Natural gas is used throughout all sectors of the economy. In 1985, gas constituted 51 percent of all end use energy consumed in the residential sector of the economy, 43 percent of all end use energy consumed in the commercial sector and 38 percent of all end use energy consumed in the industrial sector. In addition, natural gas accounts for 12 percent of all fossil energy consumed in electricity generation.

Natural gas has positive attributes which will allow it to continue to be a critical source of energy in the future. First, gas supplies are plentiful. The Potential Gas Committee, the industry group that evaluates future gas resources, has estimated that with forseeable technology and economics, the United States has approximately 981 Trillion Cubic Feet (Tcf) or about 57 years of gas supplies from conventional sources. However, many experts contend that the total amount of gas existing in conventional and unconventional geological formations that is currently unrecoverable exceeds 100,000 Tcf. Thus, major breakthroughs in gas recovery technology enabling the recovery of one or two percent of the total gas resource base would result in doubling or tripling our 57 year recoverable gas supply. Second, natural gas is the cleanest of all fossil fuels. Gas combustion emits virtually no sulfur dioxide or particulate matter, and far fewer nitrogen oxides, nonmethane hydrocarbons and carbon monoxide than either coal or oil. Moreover, natural gas combustion does not have disposal problems such as fly ash from coal or spent nuclear fuel. Increasingly, natural gas is becoming recognized as a fuel that can be used without creating substantial environmental hazards. Third, more and more commercial and industrial users are recognizing the benefits of using natural gas. Emerging gas utilization technologies such as commercial gas cooling systems, combined cycle gas turbines, select use of gas, fuel cells and advanced cogeneration systems offer greater fuel efficiencies that will allow commercial and industrial energy users to reduce energy costs.

Although natural gas will be, in the forseeable future, a primary source of energy for the United States economy, the DOE invests relatively few of its research dollars to ensure that gas reserves will meet future gas demand. Research in the geoscientific fields of geology, geophysics and geochemistry is necessary to increase our basic understanding of the formation and recovery of unconventional gas resources. Increased understanding of unconventional gas resources is required to achieve the technological advances that will expand the recoverable gas resource base. Indeed, production from conventional sources of gas located in the Lower-48 States is expected to decline by the year 2000. Thus, increased production from unconventional sources will be necessary to compensate for

declining conventional production.

With federal assistance, the gas industry can achieve these technological advances and ultimately improve U.S. energy supply security more quickly and for substantially less money than the DOE nuclear fusion program. Even though billions of dollars have been spent on nuclear fusion research, fusion as a source of energy may not be feasible technologically until well into the 21st century.

In stark contrast, we know that, with a federal commitment of several million dollars, we can achieve technological breakthroughs in gas supply research that will expand significantly the recoverable gas resource base and improve our nation's future supply security. First, the immensity of the total gas resource base (both recoverable and unrecoverable) is well-known and well-documented. Second, recovery of much of the gas located in currently unrecoverable sources of gas is technically possible, but economically infeasible. For example, high production costs prevent the recovery of much of the gas located in tight geological formations such as Devonian Shales and tight sands. Research breakthroughs in the techniques for recovering tight formations gas could lower production costs and increase the amount of gas that may be recovered.

To achieve the results in gas supply that we envision, DOE must fund more basic research in the geosciences. DOE currently funds a small geosciences research program within the $450 million Basic Energy Sciences (BES) program. We request that Congress direct DOE to spend, from the $441 million that DOE requests for the BES program in FY 1987, $35 million for basic geosciences research. A well-funded federal geosciences program is strongly supported by the Interstate Oil Compact Commission (IOCC), via an IOCC resolution adopted last December. These funds would be used not only to conduct long term, high risk geosciences research, but also to train young men and women in the geosciences field.

Advances in end use utilization of natural gas have already increased the efficiency of gas appliances and processes. Further technological advances in gas utilization will enable a single piece of equipment to provide multiple energy services with significant cost savings and efficiency gains. Further research on electrochemical processes and thermodynamics could radically change the manner in which gas is transformed into usable energy.

Increased gas use can also provide solutions to pressing national energy and environmental problems. Our nation has several energy-related problems: (1) energy security because of oil imports; (2) air pollution

resulting from sulfur oxide emissions; and (3) potential shortfalls in electricity generating capacity. The development of new, highly-efficient gas utilization technologies can solve these problems by reducing our dependence on imported oil, reducing sulfur oxide emissions and assisting electric utilities in meeting electricity demand.

SPECIFIC FUNDING RECOMMENDATIONS

GEOPRESSURED METHANE: $11 Million

Geopressured methane is found in either a free state or dissolved in water and trapped in sedimentary rock at higher-than-normal pressures. One of the largest geopressured areas underlies a portion of the Texas and Louisiana Gulf Coast. Estimates of the total resource in-place range up to 100,000 Tcf; however, estimates of the amounts of gas that might ultimately be recovered range between 25 and 1,200 Tcf. Given the large in-place resource, geopressured methane could be a virtually inexhaustible source of domestic energy.

Research conducted by the DOE in the geopressured zones is focused on producing both gas and electricity from low-grade heat in the reservoir brine. The DOE should redirect its research efforts and concentrate more on recovering the vast amount of dissolved methane found in geopressured zones. In addition to the DOE's current geopressured program, the DOE should attempt novel approaches that utilize traditional engineering principles to maximize gas production and minimize brine production.

LIQUEFIED NATURAL GAS SAFETY: $2 Million

Liquefied natural gas (LNG) is natural gas which is converted into liquid form by reducing its temperature to minus 260°F. This technique is advantageous because it permits large volumes of natural gas to be transported over great distances and terrain not otherwise suitable for pipelines. Potentially, the resource base for LNG includes any overseas gas reserves beyond those required for local consumption. However, one difficulty with transporting LNG has been that virtually no experimental data exists on the behavior of large spills.

The Liquefied Gaseous Fuels Test Facility will allow researchers, on a user fee basis, to evaluate spills of liquefied gases, including LNG, at magnitudes far greater than has been previously possible. The research needs include investigating equipment vulnerability to natural forces, the ability of dikes to contain large spills, the advantages of in-ground storage, the behavior of spills on

different surfaces and the validation of methods for preventing accidental liquefied gaseous fuels spills.

BIOMASS: $18 Million

Since the supply of organic and waste materials is virtually unlimited, supplemental methane supplies from biomass and waste conversion can add significantly to the total future gas supply picture. Developing energy from biomass also would promote the environmental benefit of productive use of currently "useless" materials. However, the quality of the gas produced and a suitable processing technique are important concerns that inhibit the widespread use of these potential gas resources.

The sources of biomass, land and marine plant matter, must be tested to determine the appropriate technology for producing high-quality gas from the resource. Because these sources vary greatly in content, the technologies must be flexible. To produce gas economically, processing techniques must be improved to increase conversion efficiencies.

CONCLUSION

The natural gas industry recognizes that Gramm-Rudman-Hollings places severe constraints on Federal energy research dollars. Our recommendations for gas research in FY 1987 reflect these concerns. We believe that our recommendations are both necessary and prudent. If Congress adopts the gas research program supported by the gas industry, the nation will be able to bolster U.S. energy supply security and improve energy efficiency.

SOUTHWEST REGIONAL ENERGY COUNCIL

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214-570-1991

CHAIRMAN
SEN. W.D. MOORE, JR. (AR)

EXECUTIVE DIRECTOR
PATRICK J. RAFFANIELLO

April 8, 1986

The Honorable Tom Bevill, Chaiman
Subcommittee on Energy and Water Development
Committee on Appropriations
U. S. House of Representatives
Washington, D. C. 20515

Dear Chairman Bevill:

This letter is to urge you to remedy an imbalance in the FY 1987 Department of Energy Budget. I refer to the extremely low budget for fossil energy research.

The Southwest Regional Energy Council, an association of State legislators from Arkansas, Louisiana, New Mexico, Oklahoma, and Texas, adopted the enclosed resolution. The resolution expresses the member-States' concern with the level of federal research support devoted to geoscientific issues associated with the discovery and production of oil and gas.

In 1985, the Department of Energy's research and development budget was over $1.8 billion. Less than ten percent of that was spent on geoscientific research to enchance oil and gas discovery and production. In comparison, oil and gas resources currently satisfy sixty percent of the United States' energy needs and are expected to satisfy fifty percent or more of those needs through the year 2010.

New oil and gas discoveries must be made in order to avoid over-reliance on foreign oil supplies. Due to the maturity of the United States as a producing province, it will be difficult, if not impossible, to discover and produce the new hydrocarbon resources needed for the future without significant new knowledge and technology in the geosciences. Redirection of research and development funds already in the Department of Energy's budget can address these needs and significantly enhance our national security by increasing the United States' domestic oil and gas production capability.

I hope you will weigh the enclosed recommendation of the producing States' legislators in your consideration of the Department of Energy's budget for Fiscal 1987.

Sincerely,

Jerry Clark

Representative Jerry Clark
Chairman Elect

EXECUTIVE COMMITTEE

Rep. Jerry Clark (TX), 1st Vice Chairman, Rep. Fred Agnich (TX) Rep. Doc Bryan (AR) Rep. Lloyd George (AR) Sen. Grant Jones (TX) Sen. Don Kelly (LA) Rep. Clyde Kimball (LA) Rep. Dick Knowles (NM) Rep. Charlie Morgan (OK) Sen. Jack Morgan (NM) Rep. Mike Morris (OK) Sen. Knox Nelson (AR) Sen. Samuel B. Nunez, Jr. (LA) Rep. Bill Ramsey (AR) Sen. Roy Sadler (OK) Rep. J. Chris Ullo (LA)

Introduced by Senator
Roy Sadler (OK)

Policy Statement of the Southwest Regional Energy Council

Regarding National Energy Research

Background.

The United States is predicted to rely upon oil and natural gas to satisfy approximately fifty percent of its' energy demand for the next 25 years. years. Currently, the United States demand for oil is not being satisfied by domestic production alone, but is substantially dependent upon imported supplies.

United States hydrocarbon resources could be utilized to fill future demand, thereby reducing the reliance on imported oil and concurrently stimulating domestic economic activity. New technology and favorable public policy could stimulate domestic production from non-traditional geologic formations and promote enhanced oil recovery from an estimated 500 billion barrel reserve.

The U.S. department of Energy Research and Development Budget in recent years has been seriously inbalanced. Less than ten percent of available funds for all energy research projects has been allocated to oil and natural gas projects. A comparison of the budgeted amounts shows that:

•	Oil research	$30.303 million	1.42 percent
•	Natural gas	$134.947 million	6.32 percent
•	Coal	$353.589 million	16.58 percent
•	Nuclear	$992.615 million	46.56 percent
•	Other	$620.453 million	29.10 percent

Action.

The Southwest Regional Energy Council urges the U.S. Department of Energy to promote the use of domestic resources of oil and natural gas to satisfy future demand. Further, the Southwest Regional Energy Council urges the Department of Energy to correct the severe imbalance between funding priorities in the its energy Research and Development budget and the projected United States demand for energy, by shifting sufficient funds within its planned budget to eventually provide for an adequate program in oil and gas research. This must be accomplished by reallocating funds already committed and not by increased federal spending. A properly balanced research and development budget would advance the state-of-the-art in these technologies and, through funding at leading universities and other qualified facilities in the field, assure the availability of well-trained professionals in the geoscientific field which will be needed by our country to satisfy the demand for oil and gas, to the maximum extent practicable, from domestic resources.

Adopted April 3, 1986

WEDNESDAY, APRIL 9, 1986.

ENERGY STORAGE PROGRAM

WITNESS

DONALD R. GLENN, VICE PRESIDENT, ENERGY RESEARCH CORPORATION

Mr. BEVILL. Mr. Donald Glenn.

Mr. GLENN. Thank you, Mr. Chairman, Mr. Myers, members of the subcommittee.

I am Donald R. Glenn, Energy Research Corporation's Vice President.

Energy Research is a leader among a very unique community of firms that is dedicated to the research and manufacture of electrochemical technologies in the forms of batteries and fuel cells.

As your committee has been hearing all day, you hear some observations on forecasted and research needs, and a whole variety of technologies, fusion, nuclear-based technologies.

The gratification of performing research is to see that it meets a destiny, and that would be that the market is there at the time the research needs to be transitioned into the marketplace.

While fusion is more comfortable to most people because it is 20 years out, other technologies have lesser or greater timeframes in which to make your key decisions as to which technologies to pursue, which to encourage, the DOE with.

In the horizon in the next 10 to 15 years, most utilities are seeing rising costs, while fossil energy prices are dropping.

The reason, of course, has to do with capital commitments that the utility sector have made and are committed to, that have been complicated by lead times for construction of large plants, whether it be coal or nuclear based.

It appears that the uniform consensus that utility additional growth is going to be in the form of incremental capacity additions, smaller generation stations, and also, better ways to manage that generation capacity that they now have.

The energy storage program at DOE has identified that there should be a priority to this type of load management technique. That is, the ability for a utility to continue to use existing generation capacity to a greater level or therefore, meet higher loads than the generators themselves are rated at.

The program that I am coming before you with is such a program.

Your subcommittee has fully funded the program for the first two of its three-year DOE life which is then to be followed by some "x" number of years of technology transition by commercializing the technology by my firm and other utilities and possibly large industrial users.

The technology is important because it shows up as being a rather cheap technology to go and finish as opposed to a sophisticated aerospace high-tech approach.

It has technological challenge, but it is more in the engineering vein of making teams work for a long period of time, and not in things that would be very aerospacely sophisticated.

It is very practical, but still has core technology hurdles to overcome.

The DOE is in a three-year program with EPRI, with a total program involved, about 11-plus million dollars, and my company is investing about $1.5, and DOE's total commitment is $4.7, and 60 percent coming from private sector, and we are cost sharing to both of those.

The program is in a deferral mode for fiscal year 1986, and your subcommittee has very generously seen it is necessary to overturn the deferrals, and we would hope that that process to a natural favorable conclusion and the program continues on so we could finish the job.

Rather than continue on with our formal sense of a statement, we would hope that the committee would allow us to complete the DOE portion of this total program by appropriating about $1.72 million for the final year of the government's version of the program, and allow the remainder of the funds that are to be provided by the private sector to come into being and see the program through to a 1989 timeframe demonstration.

Alluding back to what I said about the timeframe of research, hoping that it makes the market at a point when the market wants it, we believe the market wants this technology in the early 1990's-on timeframe, when there is going to be a generation crunch, when central power stations are going to be in short supply or not under construction, and this program is timed in that, to meet that type of a target.

If we have problems and delays, then we might miss that target and something else will come along, the mother invention. It might be more costly and more trying on the society, so I would hope we will see this through and get the job over with.

Thank you.

Mr. BEVILL. Very good.

[The statement of Donald R. Glenn follows:]

Statement of

Donald R. Glenn
Vice President

ENERGY RESEARCH CORPORATION

U.S. House of Representatives

Appropriations Committee

Subcommittee on Energy and Water

Tom Bevill, Chairman

Hearings on Fiscal Year 1987 Appropriations

for the

Department of Energy

o **Energy Storage and Distribution**

\pril 9, 1986

STATEMENT OF DONALD R. GLENN

VICE PRESIDENT

I am Donald R. Glenn, Vice President of the Energy Research Corporation, a subsidiary of the St. Joe Minerals Corporation, a Fluor Company. ERC is among the top two U.S. capabilities dedicated to advancing and manufacturing electrochemical power production equipment, specifically fuel cells and batteries. In what appears to be yet another year in which the energy R&D sector is being subject to further reductions, I am very pleased to have been asked to provide testimony of our views on the DOE FY 1987 Budget Request and its impacts on current activities.

Overview

The prospects are for incremental increases in generation capacity and incorporation of load management techniques (by utilities and larger industrial users) to be the power supply strategy in the 1990-2010 period. Large central station power-plants impose too high a financial burden and too long (and uncertain) a lead time to meet increased demands. ERC's zinc-bromine battery technology can stretch existing generation capacity very economically and over an extended life, with high efficiency.

The DOE, EPRI and ERC are technically and financially linked in two closely interrelated programs to bring this battery to a point of demonstration at a representative scale for utility or industrial applications. Congress appropriated the needed DOE-contributed funds in the first two of the three year effort. The last year, FY 1987, will require $1.72 million to finalize the core technology development phase and permit scale-up and battery system engineering (the EPRI segment) activities to move forward on schedule.

Introduction

Before getting into the heart of my statement, I have to preface my remarks with a caution. The civilian energy R & D program appears to be under attack by the Administration once again this year. In assessing the short term energy horizon, it may be convenient to create a case for dramatic, and disproportionate budget reductions (in energy development) from among the R & D agencies. However, there is no doubt that our energy wants, and the supply systems ability to respond to those demands have different time constants. It takes much longer to bring the supply-side energy and new power resources to the marketplace and this does not consider any foreign oil or gas sources and their reliability. In setting your priorities in this fiscal climate, I hope that the other "defense" sensitivity, our energy

security, is viewed as the equivalent in our power and industrial "bloodline" as weaponry is to our military.

There's a new twist to our complex energy situation this year due to a series of unrelated events that together form a clear picture of a nearer term energy strategy; first, the issues:

1. Passage of the Gramm-Rudman-Hollings Act.

2. Rising electricity costs in the face of an energy "glut."

3. Confident forecasts of the need for new generation capacity and incorporation of load management systems in the 1990's.

4. The heightening concerns for the effects of acid rain.

5. Ridiculously long lead times to build large nuclear or coal-fired central station power plants and their escalating costs.

6. The Administration's consistent downplay of the DOE's Fossil Energy and Conservation/Renewable R & D programs coupled to an almost hypocritical policy switch from first espousing "long-term, high risk" research to now requiring 50% private sector participation with the government, in concert with competitors in energy systems development activities.

In a strange way, most of these items combine to support a new ERC technology realizing excellent progress and success along the path toward first systems trials by intended commercial interests.

It is certain that the Gramm-Rudman-Hollings Act will press for broad and deep spending cuts in, among other areas, energy R & D. An eventual tax increase will only come after all desperation measures of budget cuts are exhausted. Coupled to the Administration's new FY 1987 Budget which proposes to further stifle technical advances in new energy systems, energy security is clearly not a priority despite foreign oil instability. In light of this, there is a pattern that is emerging that can aid in formulating a rationale for decisions impacting the energy sector. As you know, both oil and natural gas prices have been in decline for some time. Some of the reasons for this is reduced consumption due to a general decrease in heavy industry production, process improvements to non-energy intensive methods, transition from smoke-stack industry dominance to services and electric-driven manufacturing, and infighting among the OPEC nations. Utilities, having been stung by abandoned or lengthy nuclear plant construction projects, and very complicated institutional barriers to siting. As a result, they are moving away from large capital-intensive new plant investment to incremental generation additions and load management techniques to meet their steadily increasing demands.

Zinc Bromine Battery and Program

The Zinc-Bromine Battery System will play a significant role in utility bulk energy storage. Utility generating capacity shortages are likely, starting in the early 1990's as regional power requirements exceed the available generating capacity. Shortages will first become evident during the peak demand periods during the day. The zinc-bromine battery, charged during low demand periods, will contribute to meeting peak demand requirements by supplying energy on discharge in tandem with the generators. Present utility practice is to install expensive, inefficient gas turbine generators to meet peak demands that exceed existing capacity. The Zinc-Bromine Battery is a superior option as it conserves fossil fuels, is environmentally clean, is much more efficient (75% vs 30%), and which offers the additional capability of supplying reserve power during unplanned outages.

Categorized as a flow battery, there are several characteristics of the zinc bromine system that distinguish it for utility bulk power storage as well as other storage applications (in wind or photovoltaic systems). The reactants-zinc and bromine-are abundant, low cost materials. The electrodes and most of the other parts used in the battery are low-cost carbon/plastic composite materials. The electrodes serve as the sites on which the electrochemical reactions occur. Unlike other more common battery systems, these electrodes are not chemically altered during the operation. This unique feature means that a cycled (older) battery, when fully discharged, is physically identical to a new battery. The zinc bromine battery therefore has the potential to exhibit unprecedented useful life. To exploit this potential, the ERC program has a wide scope, ranging from studies of the fundamental electrochemistry of the $Zn\text{-}Br_2$ couple to engineering studies on full size utility battery design concepts. This work is divided into two separate, but closely coordinated, projects: the fundamental core technology research is funded by the Department of Energy (DOE) and the engineering and prototype battery design by the Electric Power Research Institute (EPRI). Both programs are cost-shared by ERC.

The three-year DOE-supported program includes basic research activities on the battery electrochemistry and supporting R & D activities, where the cell and component designs are to be optimized. The development studies on the battery system will include hardware design and battery scale-up activities. At the two year point, a design will be chosen and two 50 kWh prototypes will be built and tested in the third year of the program. Successful operation of the 50 kWh prototypes will qualify the design and initiate the fabrication of a 500 kWh demonstration battery (in the companion EPRI supported program). During the third year of the DOE program, while the 50 kWh prototypes are built and tested, technical attentions will shift to other battery applications, particularly electric vehicle energy storage. The EPRI supported program is a four

year effort involving utility battery applications studies and the fabrication of a 500 kWh battery for testing at the BEST facility, or a host utility's site.

Although funded by two separate agencies, the programs are closely coordinated and highly interdependent. As presently planned, neither program can be successful without the other complimentary program.

Turning to the overall funding situation, the Congress has appropriated the needed funds for the first two years leaving only the third and last year to complete the DOE-portion. Assuming no adverse impact to the already-appropriated amounts, a total of $1.72 million is required in FY 1987.

I am pleased to announce that in January of this year ERC entered into a technically very valuable three year, $3 million program with Murdocn University and ZBB Corporation, both of Australia. The agreement calls for the Australians to provide the funding in a technology exchange program. Murdoch University has been investigating zinc-bromine technology for over 10 years and holds numerous patents. ZBB Corporation was formed to develop and commercialize any resulting battery system. In agreeing to share technologies, ERC obtains all rights to any and all developments (past and future) resulting from the Australian effort in exchange for ERC technology as applied by ZBB to Australian and New Zealand markets. ERC expects to overlay all contributing advances to either the DOE (core technology) or EPRI (battery engineering) programs to further the success potentials in meeting our technical and economic objectives the first time around, including a full-scale utility-financed commercial installation. As an interesting side note, the Australian interests are in coupling this battery with wind- and photovoltaic power generation systems. Both solar resources are very abundant in the Australia-New Zealand region.

Conclusion

The zinc-bromine program is a very successful example of government and private sector cooperative R & D and eventually, demonstration with intended users monitoring the resulting hardware. On the contractor side, ERC as the battery component manufacturer, Applied Engineering Corporation, the system designer/manufacturer and Fluor's Advanced Technology Division, the architect/engineer, for the overall battery installation are a total capability team able to affect technology transfer, manufacture and market this new load management system. The remaining one-year (FY 1987) of DOE support assures the program will be carried through to a demonstration, funded by the private sector organizations who are contributing about 60% of the total funding requirements.

Mr. BEVILL. The deferral takes place immediately and stays into effect for one year unless the Congress overturns it. And this subcommittee, as well as the committee as a whole, has placed the rescission of that deferral in this supplemental appropriation bill. So, you can and should keep your fingers crossed.

Mr. GLENN. We will.

Mr. BEVILL. All right.

WEDNESDAY, APRIL 9, 1986.

DOE-POWER MARKETING ADMINISTRATIONS

WITNESS

MORGAN D. DUBROW, ENERGY AND ENVIRONMENTAL POLICY DEPARTMENT, NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION

Mr. BEVILL. All right. Next, we have Mr. Morgan Dubrow.

Mr. DUBROW. Thank you, Mr. Chairman.

I am Morgan Dubrow, and we consist of some cooperatives, several thousand people. I want to make about five points for the committee.

We strongly oppose the President's budget proposal to dispose of the power marketing agencies, and I have attached a resolution to my statement which was unanimously approved at our 42nd annual meeting that sets out some of the benefits and problems that we would be faced with if this became a reality.

I am very pleased to support the budget of the Corps and the Bureau and parts of the DOE budget which deals with the PMAs and deals with the nuclear power program.

I note that both the Army and the Bureau have funds for new starts, and I think that is excellent.

I want to call particular attention to the Garrison project and ask that the $18 million for Garrison be appropriated, and if the Congress should adopt a bill which would meet with the commission's views, I would hope that $30 million would be added so that project could be continued.

The Bureau of Reclamation's budget has $150 million for O&M which is a marked improvement, and I would hope that the committee would ask that the Bureau come forth with a program of yearly maintenance so that they are able to take care of the maintenance of the projects.

The power marketing agency's budget contains a carry-over of $59 million which I understand has already been expended, and I hope that the committee will be able to restore the $623.5 million that they need.

The nuclear program on its face, looks good, but when you examine it you find the advanced reactor program has dropped about fourfold, and a lot of the money which we expect to be in that program is programmed for the strategic star wars program.

We have no opposition to that program, but we hate to see money which would normally go into helping the United States stay in the game of advancing the construction, advancing a nucle-

ar reactor program, we hardly have enough money to continue to cooperate with the people who are building it.

We ask for $28 million for the modular high temperature gas reactors, which hopefully in the not too distant future, will be a prototype and we will be able to use those in the decades ahead.

I appreciate the opportunity to present this statement.

Mr. BEVILL. Thank you very much.

[The statement of Morgan D. Dubrow follows:]

STATEMENT OF NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION
ON F.Y. 1987 APPROPRIATIONS
BEFORE THE SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT
COMMITTEE ON APPROPRIATIONS, HOUSE OF REPRESENTATIVES

April 9, 1986

Mr. Chairman, my name is Morgan Dubrow, Chief Engineer of the National Rural Electric Cooperative Association (NRECA). NRECA is the national association of over 1000 rural cooperatives which supply central station electricity to some 25 million people in the rural areas of 46 states.

We are strongly opposed to the President's budget proposal for F.Y. 1987 to dispose of the Federal Power Marketing Administrations (PMAs). The rural electric cooperatives are determined to defeat any attempt to sell the Government's electric power systems.

NRECA supports the F.Y. 1987 budget request for the Corps of Engineers, the Bureau of Reclamation, the Department of Energy's PMAs, and other DOE energy programs. Our support of the cost-sharing proposals set out in the Bureau's and Corps' programs is conditioned on criteria under which the Federal Government selects and operates the projects, protects preference, and provides for the sale of power by the PMAs at the lowest cost as presently required by law. We also support DOE's nuclear programs for safety, enrichment, breeder reactor systems, nuclear waste disposal, advanced converters, and high temperature gas reactors. NRECA emphasizes the need for:

- $27.0 million for continued funding of the F.Y. 1986 new construction starts for the Bureau of Reclamation, and $47.0 million for new construction starts by the Corps of Engineers.
- $30.0 million for the Central Valley Project, California.
- $25.0 million for the Richard B. Russell Dam, Georgia-South Carolina.
- $18.0 million for Garrison Irrigation Project, North Dakota, as presented in the President's budget; $30.0 million additional if the reformulation bill is enacted.
- $2.5 million for Harry S. Truman Dam, Missouri.
- $203.9 million for Central Arizona Project, Arizona.
- $83.8 million for the Bonneville Unit of the Central Utah Project, Utah.
- $44.5 million for Columbia Basin Project, and Chief Joseph and Bonneville power plants in the Pacific Northwest.
- $4.8 million for Atmospheric Water Resources Management.
- $24.7 million for Dallas Creek and Dolores projects.
- $150.0 million for the operation and maintenance budget of the Bureau of Reclamation.
- $623.5 million for the five Federal power marketing agencies.
- $603.5 million for nuclear programs.
- $28.0 million for modular high-temperature gas reactors.
- $20.0 million for electric energy systems research.
- $10 million for multimegawatt phosphoric acid fuel cell technology development.

At our 44th annual meeting in Las Vegas in March 1986, our members again unanimously passed resolutions supporting appropriations for a number of water resource and hydroelectric projects throughout the United States. NRECA encourages the Congress to fund plans and construction for comprehensive water resource projects including hydroelectric power development.

Opposition to Sale of Power Marketing Administrations

We strongly oppose the President's budget proposal to dispose of the Federal power marketing administrations. The nation's rural electric cooperatives (over 600 purchase Federal power) are determined to defeat any attempt to sell the Government's electric power systems.

Our Executive Vice President Bob Bergland has declared that "such a drastic change in national policy is not only economically ill-considered, but absurd. It would have a severe and, in some cases, ruinous impact on hundreds of rural electric cooperatives and bring further economic hardship to rural America. ..."

Our membership unanimously passed the attached resolution, "Opposition to Giveaway of Federal Power Marketing Administrations." This resolution sets out in detail the benefits our consumers and the nation receive from the PMAs, and our strong opposition to the "giveaway" of these public resources.

Income from power sales helps to reduce the Federal deficit over the long term. Also, what will happen to the recreation, flood control, fish and wildlife, and the numerous public purposes for which these projects were built?

New Construction Cost-Sharing for the Bureau of Reclamation

We are pleased that the Administration has increased funding for the Bureau of Reclamation construction program to $577 million which will permit the timely completion of water resource projects as presented in the President's F.Y. 1987 budget.

The Bureau of Reclamation has successfully negotiated an agreement on cost-sharing for Boulder Canyon in Nevada-Arizona, Buffalo Bill in Wyoming, and Head Gate Rock in Arizona. The three are hydroelectric improvements and the added power will be sold by Western Area Power Administration in accordance with the preference laws. In addition, we support the initiating of construction of the Animas-LaPlata Project in Colorado-New Mexico. We encourage the Federal Government to be reasonable in its negotiations to arrive at the contribution from the States of Colorado and New Mexico. Construction of this project also would resolve the issue over Indian water rights; unless this is resolved, the Federal Government will incur very substantial additional costs.

New Construction Starts for the Corps of Engineers

We support Federal funding for the 41 new construction starts funded by Congress in the 1985 Supplemental Appropriations Act, Public Law 99-88. We note that the Administration has increased the budget request for the Corps of Engineers' Civil Works Program by about $275 million which adds support for new water resource development. We are pleased that this includes $47 million to start the 19 new water projects.

We will continue to examine each of the Administration's proposals for new hydroelectric facilities as this Subcommittee and the Congress has done on a project-by-project basis. We will examine proposed projects to assure that: 1) preference is fully protected, 2) the Federal Government selects, develops and operates the projects, and 3) power produced is marketed through the power marketing administrations at the lowest possible cost.

Central Valley Project

We support the appropriation of $30 million in F.Y. 1987 for the Central Valley Project. The Auburn-Folsom South Unit has a potential of 300 MW of hydroelectric power with the possibility of an additional 400 MW for pumpback units. Auburn Dam funds are not in the budget, pending arrangements for financing with local interests; nonetheless, we request that additional funds be appropriated for the Bureau of Reclamation to begin construction of Auburn Dam.

Richard B. Russell Dam

Funds in the amount of $25 million should be appropriated in F.Y. 1987 for continued construction of the Richard B. Russell Dam Project on the Savannah River between Georgia and South Carolina. It will provide 600 MW of needed hydroelectric power, 300 MW base load and 300 MW of pumpback power.

Garrison Irrigation Project

We support all efforts to reach agreement on the reformulation of the Garrison Diversion Unit and that work on the project be resumed. The Bureau needs the $18 million recommended, pending resolution of the reformulation legislation. However, funding for the project should be increased by an additional $30 million to implement construction consistent with reformulation legislation now being considered by Congress.

Harry S. Truman Dam and Reservoir

We support the appropriation request for $2.5 million in F.Y. 1987 to continue construction at the Harry S. Truman Dam and Reservoir which will enable the use of the full hydroelectric potential at this valuable project.

Central Arizona Project

We urge the Subcommittee to appropriate $203.9 million required in F.Y. 1987 to continue the orderly construction of the Central Arizona Project which is vital to the water supply for the State of Arizona. This would provide for the delivery of water to Phoenix and Tucson.

Bonneville Unit, Central Utah Project

We request that the Subcommittee appropriate $83.8 million in F.Y. 1987 for construction of the Bonneville Unit of the Central Utah Project which has a potential of 176 MW of hydroelectric power.

Columbia Basin and Other Pacific Northwest Projects

We support F.Y. 1986 appropriations of $31 million for the Columbia Basin Project, including river basin stabilization below the Third Powerhouse at Grand Coulee, $6 million for Chief Joseph Power Plant additions, and $7.5 million for the Second Power Plant at Bonneville Dam.

Atmospheric Water Resources Management

We support the F.Y. 1987 $4.8 million request to continue the cloud seeding technology being developed by the Bureau of Reclamation to increase water supplies in the arid West.

Dallas Creek and Dolores Projects, Colorado

We support the appropriation requests for $4.3 million to produce 4.2 MW at Dallas Creek and $20.4 million to produce 13.7 MW at Dolores Project.

Bureau of Reclamation O&M Budget

We are pleased to note an increase to $150 million in the Bureau of Reclamation O&M budget. However, it does not adequately meet the funding needs for preventative maintenance for power and water contracted for by the water and power users. We encourage the Committee to request the Bureau to examine its needs for a continuing preventative maintenance program.

Federal Power Marketing Agencies

NRECA supports the $623.5 million for F.Y. 1987 appropriation request for Federal power marketing agencies. This would increase the budget request by $59.2 million to make up for anticipated carryovers which we understand are not available and should be restored. The F.Y. 1987 requests by agencies are: $283.8 million for the Western Area Power Administration, $21.7 million for the Southeastern Power Administration, $38.6 million for the Southwestern Power Administration, and restoration of the $3.3 million for the Alaska Power Administration. We also support the Bonneville Power Administration's $276.1 million budget funded through its self-financing revolving fund procedures. We suggest that similar revolving funds for the other power marketing agencies would be desirable and we support proper legislation to achieve this end.

The five power marketing agencies continue to carry out their programs efficiently and effectively. They continue to market power from Federal projects to encourage widespread use in accordance with preference laws. At the same time, power is sold at rates which recover all costs -- interest, amortization, operation and maintenance over the project repayment period as established by the Congress.

Nuclear Programs

Our association has resolutions supporting nuclear power and nuclear research programs. We request the Subcommittee to provide funds for the F.Y. 1987 budget request of $631.5 million for nuclear programs. We are concerned that funding for DOE's advanced nuclear reactor program has been reduced severalfold since 1983 and larger cuts have been proposed for F.Y. 1987. Furthermore, NRECA believes that the diversion of funding away from civilian reactor objectives toward strategic defense initiatives will be a further major detriment. While our association does not object to the use of appropriate reactor technology to fulfill SDI objectives, in our judgment such support should not be a substitute for maintaining progress in civilian programs.

Funds are vitally needed to continue development of nuclear technology for improved safety, waste management, enrichment, reactor standardization and other improvements. This advanced technology is essential for continued development and maintenance of a viable nuclear industry and to support the ongoing nuclear power program which provides over 15 percent of our nation's electrical needs. We urge the Subcommittee to provide all the funds requested for the following programs:

- $302.9 million for nuclear energy research and development
- $294.1 million for nuclear waste technology
- $6.5 million for civilian waste research and development
- $28.0 million for the modular high-temperature gas reactor

Modular High-Temperature Gas Reactors

NRECA has for many years supported the development of the modular high-temperature gas reactor (HTGR). We urge your Committee to support the House Science and Technology Committee's recommendation to provide the Department of Energy $28 million in F.Y. 1987 to meet the nuclear challenge of the future by developing this small passively safe nuclear system. A recent survey of the U.S. domestic utilities indicates that small modular nuclear systems will dominate the future U.S. nuclear market because they will more closely match the users' needs. We believe the HTGR will fill this need because of its passive safety, design and operational simplicity and potential to achieve power costs which will offer economic advantages over alternative generating systems. Many rural electric cooperatives will be adding small increments of capacity over the next several decades and a small modular HTGR will be an attractive candidate for this new capacity.

Electric Energy Systems Research

We support a long-range Federal commitment for DOE Electric Energy Systems (EES) research at a minimum level of $20 million, along with adequate staffing for F.Y. 1987. This effort is essential because of its national security importance and impact on electric power production and delivery. The kind of projects, which the utility industry itself cannot carry out, includes studies on the effects of electromagnetic pulse and electromagnetic fields, and technology for improving efficiencies and reliability of power generation, transmission and energy storage.

Fuel Cell Technology Development

We support a minimum of $10 million for multimegawatt phosphoric acid fuel cell technology development. Rural electric cooperatives foresee that fuel cell power plants will result in economic benefits, improved service availability, conservation of fuel resources, and a cleaner environment. We urge the Committee to support this important research which ultimately will provide commercial fuel cell power plants for the utility industry.

I thank the Committee for the opportunity to present this testimony.

Attachment

RESOLUTION

Opposition to Giveaway of
Federal Power Marketing Administrations

The Administration is proposing the "giveaway" of the five federal power marketing administrations.

Energy generated at federal hydroelectric facilities is purchased by more than 1,000 consumer-owned utility systems that serve homes, farms, business and industry in 34 states.

The federal investment in hydropower is being systematically repaid to the U.S. Treasury, with interest, by federal power customers and power revenues also contribute a significant amount of revenue to assist the repayment of irrigation costs, salinity control and fish and wildlife mitigation programs.

Some 275,000 manufacturing, wholesale, retail and service companies nationwide, which employ more than 3,000,000 people and contribute nearly $240 billion to the national economy, are served by consumer-owned utilities that rely on federal power purchases for all or part of their bulk power supply.

Rates for sale of power from federal hydroelectric developments are cost-based and provide a yardstick by which the reasonableness of rates charged by investor-owned utilities can be measured.

The Administration proposal to the giveaway of the PMAs is aimed squarely at eliminating the principle of yardstick competition, shifting all utility rates from cost-based rates to so-called market rates and transferring public resources to private ownership and control.

With this nation suffering from record trade deficits and from an agricultural depression unparalleled since the "dust bowl days" of the 1930s, this is no time to add to the competitive disadvantages that American industry and agriculture are already experiencing in world markets by unnecessarily driving up energy costs solely for the purpose of benefiting the shareholders of private utilities.

The federal power projects now coveted by the investor-owned utility industry were funded and supported by non-profit rural electric systems since their inception and during the difficult early years when investor-owned utilities generally shunned and/or opposed the projects and refused to provide power to rural America.

Public ownership and control of natural resources have provided incalculable benefits to the nation's citizens and made possible the widest possible distribution of these benefits to the people rather than to a few special private interests.

The sale, transfer or other disposal of the federal power marketing administrations or the federal power plants and related facilities would:

Threaten consumer-owned utilities and their customers with uncertainty of supply and significantly higher power rates,

Undermine the ability of consumer-owned utilities to provide reliable electric service at competitive rates and thereby increase monopoly in the electric utility industry,

Abandon existing repayment agreements between the United States and federal power users, and

Eliminate a reliable, long-term source of revenues for the U.S. Treasury.

Only Congress can authorize the transfer of the PMAs out of federal ownership, management and control. Congress has not done so, nor has Congress made any federal funds available for this purpose. Therefore, its implementation by any federal agency would constitute an unauthorized, and therefore an unlawful, expenditure of federal funds.

We vigorously oppose the sale, transfer, exchange, lease or other disposition of the federal power marketing administrations and power plants and related facilities for the production and transmission of electricity.

We call on Congress to make its opposition to the Administration's "giveaway" proposal unmistakably clear by expressly prohibiting the expenditure of federal funds to study, develop, or entertain any proposals for the transfer out of federal ownership, management, control, or operation of the federal power marketing administrations, or their functions, in whole or in part.

Instead of destroying the federal power marketing administrations as the Reagan Administration proposes, we believe that the benefits of low cost federal power should be expanded by development of additional projects to all areas of the country. Public development, ownership and control of hydro power is the wisest and best use of this natural resource.

WEDNESDAY, APRIL 9, 1986.

DOE-POWER MARKETING ADMINISTRATIONS

WITNESS

LARRY HOBART, DEPUTY EXECUTIVE DIRECTOR, AMERICAN PUBLIC POWER ASSOCIATION

Mr. BEVILL. Mr. Larry Hobart.

Mr. HOBART. Mr. Chairman, Mr. Myers, I appreciate the opportunity to testify before your committee.

I have two points to cover.

The first is to indicate the American Public Power Association's support for TVA's non-power budget and urge that that effort which has been cut rather severely in recent years be maintained at least at the current levels as provided in fiscal year 1986.

I know that you and Chairman Whitten would both be interested in this program and are supportive of the goals it attempts to reach, and we want to indicate support for that program also which has been quite beneficial.

Secondly, APPA would like to suggest to the subcommittee that it consider a prohibition in the use of Federal monies to further finance the proposal for private advertising the Federal power marketing agencies in the absence of any legislation specifically authorizing that action.

I would like to speak briefly on a couple of points relating to that consideration.

We have conducted some studies to look at the potential impact of this privatization proposal advanced by the Administration.

And our calculations, based on what we believe are reasonable assumptions about the character of the acquisition, indicate that at a minimum rate of the Federal Power Marketing Agency on the average would increase at least 68 percent if that program were implemented as proposed.

In a worst case situation, in which the buyer of the facility was asked to pay for the real value of the systems which is extensive, the rate increase might be as great as 390 percent.

There are a lot of systems across the country serving some 38 million consumers that would be affected, and they include 600 rural electric cooperatives and 500 publicly owned electric utilities in 34 states, so it is not an inconscionable matter.

In some situations, it has been suggested that the sale of these agencies would have a positive effect on the burden created by the Federal deficit, but I think it is instructive to note that all the committees on both sides of the liberal and conservative spectrum that have looked at this question have come to the conclusion that that is not accurate. What happens to the sale of assets is what happens when the government sells securities.

Money is sopped up and goes into the Federal covers and is no longer available for private investment.

The agencies represent a very valuable asset as far as the taxpayers are concerned. Some $15 billion has been invested in these programs and 20 percent of that has been already repaid to the U.S. Treasury, plus $5.3 billion in interest, so a valuable asset will

continue to remain in the hands of the taxpayers if these assets are not sold.

This proposal has drawn principal opposition in the Congress and that is also true in the State and localities.

The National Governors Association is opposed, and the Consumer Federation of American and Energy Council of America have indicated their opposition as have many farm groups, including the Farmers Union.

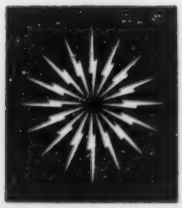
Our associations, as indicated by the National Electric Cooperative Association, oppose it also. Despite this opposition the Administration is proceeding with its plan and has set up a rather extensive bureaucracy to advance the idea.

That scheme encompasses the personnel from six departments of government: OMB, Council of Economic Advisors, and the Domestic Policy Council and its expenses are projected to also include outside tax, legal and investment advisors.

We believe that the privatization plan is a bad idea which should be discarded and not pursued at the level of effort and expenditure upon which the Administration has embarked in the face of congressional concern and the absence of any specific authorizing legislation, and we hope that you will look into this matter and seek to prevent what we believe is an unwise expenditure of taxpayer's money.

That covers my summary of my statement, Mr. Chairman.

[The statement of Larry Hobart follows:]



AMERICAN PUBLIC POWER ASSOCIATION

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Statement
of
Larry Hobart, Deputy Executive Director
AMERICAN PUBLIC POWER ASSOCIATION
before the
Subcommittee on Energy and Water Development
House Committee on Appropriations

April 9, 1986

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My name is Larry Hobart. I am Deputy Executive Director of the American Public Power Association. APPA is the national service organization representing more than 1,750 local publicly owned electric utilities in 49 states.

SUMMARY AND SPECIFIC RECOMMENDATIONS

APPA is primarily interested in three aspects of the Administration's FY 1987 energy budget:

1. The Association opposes the proposal to "privatize" the federal power marketing administrations. Sale of the nation's hydroelectric assets would neither reduce the deficit burden nor increase efficiency in the electric utility industry. It would, however, have significant adverse economic consequences for homes, businesses, and farms in a large part of the United States.

2. The Association supports the appropriations request of the Federal Energy Regulatory Commission, but questions imposition of expanded user fees. The federal government has a statutory obligation to regulate monopoly utility services to ensure that consumers are protected and pay no more than what is just and reasonable for the services received. Charging consumers "user fees" for this protection is inappropriate, particularly in view of the fact that Congress has not passed legislation authorizing most of these proposed collections.

3. The Association endorses appropriation of sufficient funds to permit the Tennessee Valley Authority to pursue effectively the non-power economic and resource development programs authorized by the TVA act. The drastic reductions proposed by the Administration for FY 1987 will stifle, if not eliminate, vital activities which aid the national and regional economy and protect the environment.

APPA requests the subcommittee to consider the following in preparing the Energy and Water Development Appropriations bill for Fiscal Year 1987:

- Prohibit the expenditure of funds for studies or the preparation of proposals relating to the sale or transfer of the federal power marketing administrations without specific prior legislative authorization.

- Review the user fees and annual charges proposed to be collected by FERC to ensure that such fees are actually paid by the beneficiaries of the Commission's activities and are not pushed off on captive utility customers.

- Support TVA's non-power program with adequate funding.

SALE OF THE POWER MARKETING ADMINISTRATIONS

Despite opposition from key members of Congress, including an admonition by Chairman Bevill not to spend too much time on the proposal because it isn't going anywhere, the Administration has set up an elaborate bureaucracy to come up with plans to sell the federal power marketing agencies (PMAs).

DOE officials have outlined an extensive four-level "Asset Divestiture Organization" to consider the PMA sales. It includes a "Senior Management Group" chaired by the DOE Under Secretary and supported by a "Headquarters Staff" of federal employees to deal with questions of procurement, administration, personnel, legal, congressional and intergovernmental relations, environment, safety, and health. The management group will have as "Senior Advisors" representatives of the Departments of Interior, Army, Justice, Treasury, and Commerce, plus the Office of Management and Budget and the Council of Economic Advisers, and will channel its work through the Domestic Policy Council headed by Attorney General Edwin Meese.

An "Asset Divestiture Group" has been established in DOE at a secondary level headed by an Executive Director. In addition to the internal resources of DOE, the group plans to hire outside private sector experts in the manner of the proposed Conrail sale. It is suggested by DOE that the price of such expertise could run as high as $5,000 a day for individual investment specialists, $500,000 a year for a firm, and one-half of one percent on the sale price in the event that a transaction takes place ($330 million if the PMAs were sold for the price recommended by the Heritage Foundation).

High-ranking federal officials with responsibility for the PMAs will constitute a third-level structure of "Program Officials," and at the fourth level there will be "Working Groups."

The exact number of individuals expected to work on this project and the total estimated cost of their activities are not specified, but there is no doubt that the contemplated studies involve a very large number of personnel and significant outlays of public monies. APPA believes that if these large expenditures are to be incurred, they should be explicitly authorized first by Congress.

To counter this expenditure of time and money on a clearly wrong-headed plan, APPA proposes language similar to Section 505 in last year's appropriations measure prohibiting funds for studying market pricing. The new language would prohibit expenditure of funds for conducting studies leading to privatization or transferring out of federal ownership, management, control, or operation the federal power marketing administrations in the absence of new legislation specifically authorizing such action.

Such an approach would be similar to that already taken by the Administration regarding its proposal to utilize straight-line amortization in repayment practices of the PMAs. DOE Secretary John Herrington and DOE Assistant Secretary Donna Fitzpatrick have both told Congress that this step will not be taken administratively, but will be implemented only if Congress passes and the President signs enabling legislation. This was also the procedure followed in the case of Conrail, where Congress approved legislation authorizing a study of sale of the system.

While implementation of the Administration's current proposal to "privatize" the PMAs would produce no revenue in FY 1987, it would create expenses. In view of the fact that the plan lacks merit on its face, it seems logical for the Congress to prohibit spending money on its advancement until -- and unless -- the Administration makes a convincing case for studying the question.

APPA believes the proposal should be discarded because it would:

- Escalate electric rates and disrupt the econom
- Eliminate a dependable source of revenue to the Treasury and not in any way solve the budget problem.
- Threaten the power supply of over 1,100 consumer owned utilities and gut competition.

"Privatization" would escalate electric rates and disrupt the economy. "Privatization" of the five federal power agencies will cost electric consumers from $2.2 billion to $12.6 billion annually in higher electric rates. Rate increases of this magnitude would be a devastating blow to millions of residential and business consumers in 34 states. It would seriously disrupt an already shaky farm economy, drive some industries abroad, reduce tax revenues, make foreign energy sources more competitive, and weaken competition in the electric industry.

The "rate shock" would be massive, based on even the minimal price tag of $13.9 billion suggested in the President's budget. This sales price assumes that the federal system would be sold for the government's remaining unamortized investment in the power facilities. That would be similar to a homeowner selling his house for the amount remaining in the mortgage.

Assuming this bargain basement sales price, we estimate that the cost of federal power would rise by about 68 percent, or some $2.2 billion a year. This increase would result from the fact that the new owners would have to trade existing interest rates, which are relatively low because the projects were financed many years ago, for the much higher private financing costs that prevail today. Private, profit-making companies would also require a return on their equity, and would have to pay federal taxes which are not required of a federal project.

However, Administration spokespersons have said that the price to be paid for the federal facilities is open for negotiation. If the Administration were to follow the advice of one of its favorite "think tanks," the Heritage Foundation, the price set for these federal investments would be $65.9 billion. Sale of the five federal power marketing agencies to private companies at this price would boost federal power costs by about 390 percent, or about $12.6 billion annually.

An estimated 38 million Americans would be affected by these rate increases at either level. The ripple effect on residential consumers, businesses, industries, and farms would be felt throughout the nation's economy. The extent of this impact was detailed in a study by the Washington, D.C., economic consulting firm, John Wilson & Associates. The study, commissioned by the American Public Power Association, showed that "privatization" of the power agencies would affect more than 265,000 manufacturing, commercial, and service businesses in the 34 states served by the consumer owned utilities that purchase federal power at wholesale. These businesses -- large and small -- employ 3.2 million people and have total sales of more than $325 billion. In addition, more than 1.3 million farms, which in 1983 produced farm products valued at $73 billion, are served by rural electric cooperatives which buy federal power. All of these are considered to be conservative estimates.

Last week, the Governor of Idaho, John Evans, pointed out that uncertainty created by continued discussion of privatization of the Bonneville Power Administration is having an adverse effect on the Pacific Northwest. In a speech to the Western States Water and Power Consumers Conference, he said:

"I also think that we must recognize the potential harm that is being done to our economy by the threat of sale. The battle to 'milk' the BPA cash cow has become an annual affair. It is quite unsettling to consider the impact that the prospective sale of BPA must have on the capital expansion plans of businesses both within and without the Pacific Northwest.

"Our region has just gone through 10 years of substantial effort to enact and implement the Northwest Power Planning Act. The inflationary trauma of the '70's and early '80's is just now settling out in the form of higher, but stable power rates. The Northwest economy is not now in any condition to serve as a point of ideological experimentation. More than anything our region needs to establish a stable economic environment so that business development can proceed on a rational and reasoned basis."

Sale of the PMAs would have costly impact on the cost of federal services because 55 federal agencies are direct customers of the PMAs, and dozens of other federal installations are served by consumer-owned systems which buy federal power.

Taking only the 55 direct service federal customers, a 68 percent increase in PMA prices would add $80 million annually to an existing federal electric bill of $117.8 million. If the percent increase were 390 percent, then the federal government would pay additional annual costs of nearly $460 million.

"Privatization" would eliminate a dependable source of revenue to the Treasury and will not help the budget situation. The federal power systems are revenue-producing assets. They pay their own way. Indeed, federal power revenues help pay for many non-power functions. Under the law, the federal power agencies are obligated to return all costs of construction -- including principal and interest -- over a 50-year period, as well as the operation and maintenance expenses. Of the total investment of some $15 billion, 20 percent has been repaid, plus an additional $5.3 billion in interest. Repayment is on schedule for each of these agencies. Last year alone, they returned to the government more than $1 billion in principal and interest.

Although production of electric power has been one of the principal functions served by the federal water projects, they also provide a number of other important public purposes including irrigation, flood control, navigation, municipal and industrial water supply, wildlife enhancement, recreation, and salinity control. Revenues from the sale of power have helped make it feasible to build these dams which provide non-power as well as power functions. It is clear that the government would have to continue to provide the non-power functions, but meanwhile would have dumped the long-term money-making service in exchange for a one-shot cash payment.

"Privatization" would threaten the power supply of over 1,100 consumer owned utilities and gut competition. Competition in the electric utility industry was one of the major justifications for consistent congressional support for the federal power marketing policy which requires that federal power be sold first to consumer owned electric utilities -- local public power systems and rural electric cooperatives. This first right of purchase assures these utilities a secure source of power which helps preserve these entities as yardsticks against which all can measure the performance of competing investor owned utilities. This type of competition benefits all consumers.

Sale of PMAs would clearly reduce competition within the utility industry. It seems obvious that the large investor owned utilities (many of which are "cash cows" at the present time) would have a tremendous financial advantage in buying the PMAs over the much smaller local public power systems and rural electric cooperatives. Unlike the PMAs, new private owners would have no obligation to offer federal power to local public

power systems and rural electric utilities. These consumer owned utilities would therefore be denied a reliable source of reasonably priced wholesale power. It is doubtful whether many of the smaller local public power systems and rural electric coops would survive this loss of power supply.

Sale of the PMAs will likely increase the concentration of control over the utility industry within the hands of a few large private power companies, and thus a major benefit of competition -- increased efficiency -- will not occur.

Further, sale of PMAs will diminish efficiency by divorcing power production from all other project purposes and by dismantling the current integrated utility operations of the PMAs.

FEDERAL ENERGY REGULATORY COMMISSION

FERC's budget request is $99.1 million, and $78.8 million would be offset by user fees and annual charges. This represents an 80 percent offset to FERC's appropriations and an increase in user fees and annual charges of $29 million over FY 1986. Of this $29 million increase in fees, FERC anticipates $26.5 million from legislation not yet enacted which would authorize FERC to impose annual charges on jurisdictional natural gas pipelines, oil pipelines, and electric utilities.

We urge this subcommittee to examine thoroughly FERC's estimated receipt of fees to assure that such fees are appropriate and do not impose hardships on consumers, the intended beneficiaries of FERC's regulatory activities.

FERC's anticipation of charging fees for regulating wholesale electric rates is critically important to the more than 900 public power systems that buy part or all of their power from investor owned utilities. In all probability, investor owned utilities will account for these user fees as a cost-of-doing-business expense and will pass on those charges to public power systems which buy wholesale power from them.

Parts II and III of the Federal Power Act were passed by Congress to protect the public interest and prevent the abuse of monopoly control in the wholesale power market. This is an essential role for the federal government to play. The beneficiaries are the public at large, and, therefore, this function should be paid from general Treasury revenues and not from special assessments which will, in the end, not be paid by the private utilities against which the assessments are made, but by a limited group of their customers -- that is, wholesale power purchasers.

TVA'S NON-POWER PROGRAM

TVA's non-power budget has been substantially reduced every year for the last several years. These activities include economic development, water quality control, agricultural land management, pollution control, forestry, flood plain management, and natural resource and fertilizer development among others. We urge this subcommittee, as it has done in the past, to reject the Administration's cuts and appropriate funds adequate to allow TVA to carry forward these programs.

TVA's non-power activities improve food production efficiency, create jobs, and enhance recreation opportunities with both regional and national benefits. Over the last five years, the program has been cut by one-third. APPA urges that the Administration's proposed 50 percent cut be rejected and funding levels in FY 1987 be maintained at FY 1986 levels.

WEDNESDAY, APRIL 9, 1986.

ATLANTA UNIVERSITY GRADUATE SCIENCE CENTER

WITNESS

LUTHER S. WILLIAMS, PRESIDENT, ATLANTA UNIVERSITY

Mr. BEVILL. Dr. Luther Williams.

Dr. WILLIAMS. Mr. Chairman, I am Luther Williams, President of Atlanta University, and I appear before you today on behalf of the Graduate Research Center for Science and Technology at our institution.

I would express my appreciation for the opportunity to appear before you, and in particular, I would like to add, I would like to thank you, Mr. Chairman, Congressman Myers, and members of the subcommittee, for the support you have already given to our graduate center.

I have submitted a prepared statement, and I would like to make three major points.

The first one, in 1983, the University made a commitment to substantially develop a graduate research center that would house our programs, organizing into four disciplinary centers: Materials Sciences Research Center, Biotechnology Research Center, and the Computational Sciences Research Center, and the Center for Basic and Applied Energy Research.

In fiscal year 1985, the Energy and Water Appropriations Bill, the House of Representatives and the U.S. Senate agreed with this language that in effect, supported provisions for these research programs to which I have just described at the university.

Shortly thereafter, the Office of Energy Research of the Department of Energy came to the university, and assisted us in developing the structure for a proposal which we submitted to the Department, and the Department awarded in October of 1984 a planning grant to the institution for a quarter of a million dollars to start the planning of the building.

We engaged—in addition, the Department made a request in fiscal year 1986 in its recommendations for $9 million for the facility, and that was subsequently disallowed in the President's budget.

At the request of the Department of Energy, we proceeded with the plan for the building, and on March first of 1985, we formally submitted the phase one product to the Department of Energy.

I shared a copy with you last April.

In your fiscal year 1986 appropriations, this committee and subcommittee took the lead in providing $6 million in your bill for our center.

The final conference agreement with the Senate provided $4.5 million for fiscal year 1986.

Nonetheless, we continue to use the planning grant and a substantial amount of university funds, because we have exhausted a great amount of it in the early period and moved to phase two, the actual architectural and mechanical plan for the facility, and in

January of this year, January 31, formally submitted to the Department the product of the second phase of that planning.

In addition, upon instruction from the Department of Energy, we worked with the Chicago Operations Office and submitted the formal construction grant application to the Department with the expectation that the construction grant would be made February 1, 1986.

As you know, the grant was not made and, in effect, the entire project has been interrupted by deferal and rescissions, proposals of the Administration.

As a result of the detailed planning, we know the full cost of the construction of the facility and the permanent equipment and I site that only in the context, in the last year and a half we made a sustained effort to generate resources from other sources, other Federal agencies, in particular, and the private sector.

If you are interested in the report of those funds, I would be pleased to provide it as some measure of national interest in what we are attempting to accomplish, all of which to some extent is very limited by being able to move forward with the building.

Mr. Chairman, I respectfully request that the subcommittee consider actions, counter, indeed, the proposed rescission of the funds designated for fiscal year 1986, so we can move forward with this project which was initiated to repeat in October of 1984.

As recent as two weeks ago in conferences with the Department of Energy, they remain interested in the project and are working with the university in seeking ways to continue to support this effort.

Mr. BEVILL. We share your feelings on that, and we hope that that rescission will expire and that we will have no further problem with it.

Thank you very much.

Mr. MYERS. Good to see you again.

Mr. BEVILL. Our mutual friend, Congressman Louis Stokes, is very supportive of your program.

Mr. WILLIAMS. Thank you.

[The statement of Luther S. Williams follows:]

DR. LUTHER S. WILLIAMS, PRESIDENT

ATLANTA UNIVERSITY

TESTIMONY BEFORE

THE APPROPRIATION SUBCOMMITTEE

ON ENERGY AND WATER DEVELOPMENT

U.S. HOUSE OF REPRESENTATIVES

APRIL 9, 1986

Mr. Chairman and Members of the Subcommittee, my name is Luther S. Williams. I am the President of Atlanta University in Atlanta, Georgia. I appear before you today to testify on behalf of the Graduate Research Center for Science and Technology. First, I desire to express my appreciation to this Committee for affording me this opportunity. In particular, I wish to thank you, Mr. Chairman, and all the members of this Subcommittee for all the support you have already given to our Graduate Research Center.

Founded in 1865 Atlanta University has served American society and its manpower needs in extraordinary measure. As the only historically black university in the United States specifically devoted to graduate and professional education, Atlanta University is a unique national and regional resource. The University responds to the nation's specific needs on three fronts: educating and training manpower; conducting research; and serving as an anchor and resource for the predominantly black colleges in the southeastern United States.

Atlanta University has focused all of its resources to graduate and professional education since 1929. By 1950, one of every three blacks in the nation with a master's degree had earned that degree at Atlanta University. Today, despite the fact that almost all universities are open to blacks, Atlanta University continues to educate between five and 10 percent of the Black American graduate population in virtually every field the University offers, and in some areas, an even higher percentage.

The significance of ca. 220 black students enrolled in AU's science departments can only be appreciated when one realizes that only 106 of the 8,978 doctoral degrees in 1983 were awarded to Black Americans.

Over the last 16 years, Atlanta University has emphasized the growth of the sciences, building upon a foundation of master's degree programs in biology, chemistry, and mathematics established in 1932. A Ph.D. program in biology was initiated in the mid-sixties, M.S. program in computer science in 1981 and a doctorate in chemistry in 1979.

Atlanta University has on-going research partnerships with a number of U.S. Department of Energy-funded national laboratories and facilities. These include formal agreements with Argonne, Oak Ridge, and Lawrence Livermore national laboratories. The University also has a working relationship with the Centers for Disease Control in Atlanta the University of California-Berkeley and the Supercomputing Center of the University of Georgia.

In addition, the University has developed close ties with industry, especially through its industrial chemistry program, which was the first such program established at a university in the United States. Since the programs's inception in 1972, 41 students have earned master's degrees and are now working in every aspect of the chemical industry.

Atlanta University is an important resource and partner for many of the Historically Black Colleges and Universities (HBCU) in their efforts to strengthen undergraduate science education. Centrally located in the mid-South, the University draws a majority of its students from HBCU's and has a long record of assisting those institutions in education and research and providing graduate training for their faculties.

In 1983 Atlanta University made a commitment to develop the Graduate Research Center for Science and Technology to serve the research Center for Science and Technology and to serve the research and science education needs of blacks throughout the Southeast and the nation. The Graduate Research Center for Science and Technology (GRC/S&T) represent a major new interdisciplinary approach to research and the attendant graduate training. In 1984 the University's trustees approved plans to proceed with the center's conceptual design and fundraising activities into one interdisciplinary modern complex that will enhance our capabilities to perform broadly based and complex research efforts using state of the art equipment and under conditions of space adequacy. This Center, thereby, will permit the achievement of quality training of minorities at the indicated levels in appropriate scientific areas and will also aid in the development of Atlanta University as a center of excellence in the relevant sciences. This center will contain laboratories and major research support facilities for research in four areas. These areas, organized as research centers, are:

1. The Center for Basic and Applied Energy Research provides for multidisciplinary studies of fusion processes, bio-solar production of hydrogen gas, production of fuels and valuable chemicals, catalysts for fuel cells, hazardous waste research, biological testing of low-level radioactive wastes, and energy policy research.

2. The Materials Science Research Center is focusing on the development and understanding of the properties of improved materials that have potential applications in both the defense and civilian industry. Emphasis is placed on composite materials, organic and inorganic ceramics, liquid crystalline polymers, polymer blends and ionomers, and gallium-arsenide semi-conductors. Specific studies will include theoretical investigations as well as processing, synthesis, and characterization, and structure-property correlations.

3. The Biotechnology Research Center is engaged in studies of carcinogenesis as provoked by industrial and agricultural agents; cellular, molecular and genetic dimensions of normal development/function of the immune system; plant responses to environmental insults; and genetic engineering (molecular cloning and host-specific expression) of selective genes of a range of organisms. Current studies involve molecular dissection of DNA-specific control sites, gene dosage responses, and biotechnical methodologies focusing on restriction enzymes, host plasmid adaption, *in vitro* site-specific mutagenesis and altered host expression of foreign genes.

4. The Computational Sciences Research Center addresses problems in applied mathematics, computational physics, and computer science, with specific emphasis on numerical and functional analysis, probabilistic and stochastic processes, computer graphics and software. Current research involves the stability of aerospace structures,

fusion energy, application of probability theory to several problems, computer language development and approximation methods in the solution of different classes of mathematical equations.

In the fiscal 1985 Energy and Water Appropriations Bill, the U.S. House of Representatives and the U.S. Senate agreed to conference language which stated:

> "The Committee recognizes that support for research programs in computational, physical, and material sciences at minority graduate universities is important. The Committee recommends that the Department provide appropriate assistance to Atlanta University and other such institutions in the development of its graduate science and technology research center."

The Office of Research of the Department of Energy (DOE) immediately worked with Atlanta University to develop the center. DOE sent a team to Atlanta to work on the design and in October, 1984 awarded the University $250,000 to support their planning efforts.

The Department of Energy, in its fiscal 1986 budget recommendations to OMB included $9 million specifically for the Atlanta University Graduate Research Center.

Subsequently, OMB dropped DOE's recommendation from the President's fiscal 1986 budget.

At the request of the DOE, the University has completed the conceptual design program for the science facility and formally submitted the result to DOE on March 1, 1985. A copy of which was presented to this committee for your review on April 3, 1985.

We are grateful that for fiscal year 1986, this Subcommittee took the lead and provided 6.0 million in your bill for our center. As you know the final conference agreement with the Senate provided for 4.5 million.

Employing the DOE Planning Grant and University funds, the Phase II architectural and engineering design has been completed, and the pre-award patent information and Federal Assistance Construction Grant Application has been formally submitted to the Chicago operations of the DOE with an effective start date of February 1, 1986, with budget schedules for FY 1986 - FY 1988. Obviously, the construction grant was not made on February 1, 1986 and, in effect, the entire project has been interrupted by the deferral and recession proposals of the administration.

The total cost for construction and permanent equipment of the center is 24.7 million. The University has already received pledges or commitments from several corporations for millions of dollars in equipment

and program support. I hope this subcommittee will oppose the President's proposed recession of these fiscal year 1986 funds so that we can move forward with the Center plans, thereby permitting reinitiation of this project begun in October, 1984.

In closing, I fully understand the overall national fiscal realities negatively impacting this project. Nonetheless, Atlanta University deserves the increased capacity to move boldly ahead with its agenda of research and graduate training of black scientific and technical manpower. In pursuit of this critically important national goal, the requested support of this science facility will be a good investment for the United States.

Thank you.

WEDNESDAY, APRIL 9, 1986.

ENERGY SCIENCES

WITNESS

FREDERICK C. LEAVITT, DIRECTOR, GOVERNMENT SCIENCE RELATIONS, THE DOW CHEMICAL COMPANY

Mr. BEVILL. Mr. Myers.
Mr. MYERS. Good to see you.
Mr. BEVILL. Mr. David Luster.
Next, Dr. Leavitt.
Dr. LEAVITT. Thank you, Mr. Chairman.

Dr. Klaus Mai of the Shell Development Company planned to be here, and he is unavoidably out of town. He is currently chairman of the governing board of the Council for Chemical Research, CCR, and he wished that this testimony be presented in their behalf.

I am Fred Leavitt, Director of Government Science Relations with the Dow Chemical Company, and I appreciate this opportunity to express CCR's interest in the chemical sciences part of the DOE requests for the basic energy sciences budget.

Council for Chemical Research is an organization of 148 leading universities and 47 major companies working together to strengthen the academic industrial base for U.S. technological competitiveness.

Our purpose is focused on strong interactions between academia and industry and on support for basic research in chemical industry and chemical engineering and our membership includes every research university in the U.S. and companies that do 75 percent of the Nation's industrial research in this field.

We currently contribute approximately a net $10 billion to the positive side of the national balance of trade and our continued competitiveness depends upon constant improvement of existing products and introduction of new ones.

Plentiful and inexpensive energy will be a key to maintaining this leadership as 92 percent of our energy consumption is and will be for many years based upon chemical technologies.

New chemistry-based energy sources will have to be tapped and include fuels such as low grade coal and fuels with lower energy and higher sulfur content.

For these, better control of chemical reactivity is needed so we can protect the environment while producing, cleaning, and burning them at a reasonable cost.

Fundamental nature of the needed advances dictates a significant and continuing commitment to a broad research program in chemistry and chemical engineering.

Chemistry is poised to respond to these challenges. We must turn to those areas of science and technology which have already contributed solidly to our Nation's economic well being and security.

Chemistry is a stand-out in this respect. The excellent National Research Council report, "Opportunities in Chemistry", makes similar conclusions about the current state of chemistry. They use words such as "unsurpassed, intellectual, excitement, seriously underfunded".

The President of the National Academy of Sciences recently observed U.S. science has immense unrealized opportunities for advancing our competitiveness and called this report a towering achievement.

At the recent Government/University/Industry (G/U/I) Research Roundtable in Washington, the sense of the group was that the nature of research makes it particularly vulnerable to instability in support.

In particular, a field of research can suffer long-term damage if the best students and young talent are not attracted and retained.

Active research teams, once disbanded, cannot easily re-assemble. And loss of access to the most advanced equipment is often the difference between world-class and second-rate work.

While CCR gives it attention mainly to university and industrial research teams, we must not lose sight of the important contribution made to research and education by the DOE National Laboratories.

An example of first-rate science conducted at the National Laboratories is that of Professor Yuan T. Lee of the Chemistry Department at the University of California-Berkley; the work is carried out under the auspices of the DOE's Chemical Sciences program at the Lawrence Berkley Laboratory.

His pioneering research with molecular beams and finely tuned lasers brought him one of our Nation's twenty National Medals of Science, awarded by President Reagan earlier this year.

In spite of all this, the Department of Energy devotes only a small portion of its basic research program to the chemical sciences.

Only 12 percent of the $1.4 billion DOE commitment to basic research ($175 million) is directed to support of chemistry. Even that small figure, the panel was told, was arrived at by using a broader than usual definition of chemistry.

With over 90 percent of this Nation's energy consumption coming from chemical technology now and for the foreseeable future, 12 percent in support of chemistry in the basic research budget is obviously inadequate.

This is especially true in view of the proven outstanding value of chemical research to our general economy.

As chemists, we are both excited and awed by the recent accomplishments and anticipated discoveries on the horizon at a number of chemistry frontiers.

While these are not really new research areas, what is new is an arsenal of now available tools—highly sophisticated instruments—that allow us to explore problems that were previously intractable.

A minimum of $25 million should be added to the Chemical Sciences section of the DOE Basic Energy Science budget request.

The Council for Chemical Research appreciates the opportunity to provide testimony to this committee on this important matter.

In conclusion, we note that the current abundance of fossil energy sources, although encouraging, comes from a finite reservoir—and hopefully, provides us with the necessary time to perform the research to assure the basis for our energy future in the 21st century.

Thank you very much.

[The statement of Frederick C. Leavitt follows:]

April 9, 1986

Testimony on the Department of Energy's Research & Development Budget for FY 1987

by Dr. Klaus L. Mai
President, Shell Development Company

Presented by Dr. Frederick C. Leavitt
Director of Government Science Relations,
The Dow Chemical Company

before the

Subcommittee on Energy and Water Development

of the

Committee on Appropriations
U.S. House of Representatives

Honorable Tom Bevill, Chairman

SUMMARY

The Council for Chemical Research (CCR) comprises some 200 leading universities and companies. We note, on the one hand, the central importance of chemistry in our energy supply (92% of our energy is, and will be for many years, based on chemical technology). On the other hand, the Department of Energy's request for Fiscal Year 1987 funding of its Chemical Sciences Program is, at most, 12% of the Energy Research dollars for basic research. Noting also the extremely promising opportunities in basic chemical research as described by many experts, CCR strongly urges the addition of $25 million to DOE's funding request for the Chemical Sciences.

Mr. Chairman and Members of the Committee:

I am Klaus Mai, President of the Shell Development Company, and currently Chairman of the Governing Board of the Council for Chemical Research (CCR). I appreciate this opportunity to testify before this distinguished Committee to express CCR's interest in the Chemical Sciences part of the Department of Energy request for the Basic Energy Sciences budget.

The Council for Chemical Research (CCR) is an organization of 148 leading universities and 47 major companies, working together to strengthen the academic and industrial base for U.S. technological competitiveness. Our purpose is focused on strong interactions between academia and industry and on support for basic research in chemistry and chemical engineering. Our membership includes virtually every research university in the U.S. and companies that do 75% of this nation's industrial research in these fields.

The U.S. chemical industry currently contributes approximately a net $10 billion to the positive side of the national balance of trade. Our continued competitiveness depends upon constant improvement of existing processes and introduction of new ones. Plentiful and cheap energy will be a key to maintaining this leadership, as 92% of our energy consumption is based upon chemical technologies. This will remain true well into the 21st century.

But new chemistry-based energy sources will have to be tapped. They will include fuels such as low-grade coal and fuels with lower energy and higher sulfur content. For these, better control of chemical reactivity is needed so that we can protect the environment while producing, cleaning and burning them, all at reasonable cost.

Specifically, nothing is more critical to the long-term health of our technological society than continued access to abundant and clean sources of energy. Fundamental changes in these sources are clearly ahead as world petroleum production peaks near the end of this century and begins its inevitable decline. In every one of the foreseeable alternatives, developments are needed in which chemistry and chemical engineering play a dominant role. The fundamental nature of the needed advances dictates a significant and continuing commitment to a broad research program in chemistry. The program should exploit to the fullest the

powerful array of new instrumental methods that permit us: (1) to study in intimate detail reactions on surfaces known to the scientist as "catalysis"; (2) to advance our knowledge of molecular dynamics (for example, combustion); (3) to understand, in depth, the absorption of light and chemical storage of its energy (in scientific terms, photosynthesis and photochemistry); and (4) to deal with the environmental and waste management dimensions of the new energy technologies that will evolve.

Fortunately, chemistry is poised to respond to these challenges. Now we are concerned nationally with huge deficits. For that very reason, we must turn to those areas of science and technology which have contributed solidly to our nation's economic well-being and security. Chemistry is a stand-out in this respect. If properly supported, it will continue to contribute. Society must declare its commitment in order to provide the encouragement that will attract bright young people to these tasks and to marshall the resources needed to accomplish them.

The excellent National Research Council report, "Opportunities in Chemistry," which resulted from a three-year in-depth analysis by dozens of the top research chemists of this country, backed by contributions of hundreds of their colleagues, makes similar conclusions about the current state of chemistry: unsurpassed intellectual excitement, unbounded practical promise, seriously underfunded. The President of the National Academy of Sciences, Dr. Frank Press, who recently observed that U.S. science has immense unrealized opportunities for enhancing our competitiveness, called the report "a towering achievement."

At the recent Government/University/Industry (G/U/I) Research Roundtable in Washington, the sense of the group was that the nature of research makes it particularly vulnerable to instability in support. In particular, a field of research can suffer long-term damage if the best students and young talent are not attracted and retained. Active research teams, once disbanded, cannot easily reassemble. And loss of access to the most advanced equipment is often the difference between world-class and second-rate work.

While CCR gives its attention mainly to university and industrial research teams, we must not lose sight of the important contribution made to research and education by the DOE National Laboratories. An example of first-rate science conducted at the National Laboratories is that of Professor Yuan T. Lee of the Chemistry Department at the University of California-Berkley; the work is carried out under the auspices of the DOE's Chemical Sciences program at the Lawrence Berkley Laboratory. His pioneering research with molecular beams and finely tuned lasers brought him one of our nation's twenty National Medals of Science, awarded by President Reagan earlier this year.

In spite of all this, the Department of Energy devotes only a small portion of its basic research program to the chemical sciences. Based on information supplied by DOE to the Chemistry Review Panel of the Energy Research Advisory Board last December, only 12% of the $1.4 billion DOE commitment to basic research ($175 million) is directed to support of chemistry. Even that small figure, the Panel was told, was arrived at by using a broader than usual definition of chemistry.

With over 90% of this nation's energy consumption coming from chemical technology now and for the foreseeable future, 12% in support of chemistry in the basic research budget is obviously inadequate. This is especially true in view of the proven outstanding value of chemical research to our general economy.

Specific areas in which additional support is needed include: basic research in catalysis, combustion processes, separation processes and, indeed, funding for advanced chemical instrumentation.

As chemists, we are both excited and awed by the recent accomplishments and anticipated discoveries on the horizon at a number of chemistry's frontiers. While these are not really new research areas, what is new is an arsenal of now available tools--highly sophisticated instruments--that allow us to explore problems that were previously intractable.

With respect to the adequate support of science, Dr. Press recently said, "The payback to society in material and intellectual gains would be enormous. And we have to make that case in a time of budgetary constraint. That to me is the key issue for American science."

A minimum of $25 million should be added to the Chemical Sciences section of the DOE Basic Energy Sciences budget request.

The Council for Chemical Research appreciates the opportunity to provide testimony to this Committee on this important matter.

In conclusion, we note that the current abundance of fossil energy sources, although encouraging, comes from a finite reservoir--and hopefully, provides us with the necessary time to perform the research to assure the basis for our energy future in the 21st century.

WEDNESDAY, APRIL 9, 1986.

SOLAR THERMAL PROGRAM

WITNESS

WALTER HESSE, SOLAR ENERGY INDUSTRIES ASSOCIATION

Mr. BEVILL. Dr. Walter Hesse.

Dr. HESSE. Good afternoon, Mr. Chairman. I appreciate very much the opportunity to talk with you today. I am President of ENTECH, Inc., a Dallas firm with ten years heritage in high technology concentrating solar systems, both photovoltaic and high-temperature steam, and I also chair a Solar Thermal Power Division of SEIA.

We have 30 member companies, and we work in high-temperature steam, working fluid so we deal with machines, energy transfer, high flux receivers and concentrators.

Some of our companies have fielded a few significant solar thermal power systems, and most of those were done through the proposal of tax credits, accelerated depreciation; but most of our companies are still in the R&D mode, and as a group, we believe it is imperative that the solar thermal R&D budget remain about the average at the last two years, $30 million, and let me at this point, Mr. Chairman, congratulate you and your committee for your courage and wisdom in always finding a way to increase the requested amount of funding to a level that is necessary to adequately support the Nation's thermal solar R&D effort.

This year the courage required will be even greater because DOE requested only $15.3 million which is down from about $27 million last year, and the committee on Science and Technology in its authorization role has marked up to a $22 million level, so we appreciate that, also.

Our industry really is at a critical juncture. Five years ago the budget for this facet of technology was $55 million, and this year it was requested only $15 million, and that rapid decline, plus the lapse or termination of tax credits, really has made a number of companies abandon their activities in this field.

Since 1981, for example, 30 percent of our companies have gotten out of the field.

The two most common reasons given are the R&D budget has declined, and the diminishing near term marketability of this technology.

Now, this new phenomenon has occurred the deferral list which we talked about before, and we believe this is not fair to those industries in the R&D, where, in many cases, industry has made commitments based on appropriated funds.

SIEA has made an extensive survey of our industry and posture analysis, and two key findings are: the industry over the years has investigated and is willing to continue to investigate a lot of private funds, usually about 20 to 30 percent of what DOE puts in; and we still believe that a strong Federal role remains essential in the R&D area. And it is especially important now while we have this quiet energy period, unlike the panic of 1973 and 1979.

So, let's do our R&D so we get good low cost systems so we can compete in the open market.

There are key issues for the Nation to have a strong solar energy industry: increase our dependence on imported oil, negative trade balance, and the national security implications and improves our environment with non-polluting solar energy, less smog, and acid rain is finally beginning to get the proper attention it needs.

The solar industry creates many new jobs, and allows utilities to build plants in modular forms and quickly, not eight to 15 tears for some coal and nuclear plants.

LUZ Engineering, one of our member firms, built a 30 M.W. electric power plant in ten months last year.

It creates exports and helps our national trade balance. Most developing nations are in great need of solar energy and will generate many new exportable products.

We can apply it to process heat for industry, electricity produced by utilities. And I like to point out with the recent oil drop crisis I have not seen many electric utility rates come down. They hang in or even go up.

A new use is for power satellites. NASA has need for housekeeping power, special high temperature use.

And in conclusion, I would like to point out that there are some good research teams in industry, laboratories, and universities, and they have evolved over ten years, and they have matured into effective working units, and they have a good network of integration and communication.

The funding from DOE through such organizations as Sandia National Laboratories played a role in helping these teams mature and get to an effective working unit, and the proposed budget recommendation of $15.3 million would really decimate these teams and many would disappear. Some have already.

It is important to remember that DOE has invested about a billion dollars in solar thermal energy over the years and that industry has invested an additional $200 million to $300 million, so if these R&D teams disappear, then our major investments would be mothballed.

We would like to have a R&D funding level for this category of about $30 million.

I thank you.

Mr. BEVILL. Thank you very much.

[The statement of Walter J. Hesse follows:]

STATEMENT OF

WALTER J. HESSE

CHAIRMAN
SOLAR THERMAL DIVISION
SOLAR ENERGY INDUSTRIES ASSOCIATION

BEFORE THE
SUBCOMMITTEE ON
ENERGY AND WATER DEVELOPMENT
OF THE
COMMITTEE ON APPROPRIATIONS
U.S. HOUSE OF REPRESENTATIVES

9 APRIL 1986

1.0 INTRODUCTION

Mr. Chairman, Members of the Committee, Ladies, and Gentlemen; I am Walter J. Hesse, President of ENTECH, Inc., Dallas, Texas, a high technology solar energy company with products of concentrating photovoltaic systems and high temperature liquid/steam systems, each with a heritage of over ten years. I am also Chairman of the Solar Thermal Power Division of the Solar Energy Industries Association, SEIA, and it is in this role that I address you today.

SEIA appreciates the opportunity to testify on the FY 87 solar programs and budgets. The Solar Thermal Power Division of SEIA consists of more than 30 member companies ... 5 Fortune 500 corporations, several utilities, and more than 2 dozen small business companies. We work with high-temperature (more than 300°F), solar generated steam and apply this steam energy to industrial process applications or use it to generate electricity by means of steam turbines or other types of engines. Thus our division's work concerns high-temperature, high-technology, solar concentrating collectors, high flux receivers, energy process flow control, and prime mover machinery.

Some of our companies have fielded a few significant solar installations, thanks to the combination of federal and state energy tax credits plus a good government R&D program. However, most of our companies' activities are devoted to advanced R&D for improved component efficiencies and lower cost so as to achieve an end product that will be competitive without tax credits in the open market. As a group we believe it is imperative for the solar thermal R&D budget to remain at the $30M level (the average of the last 2 years) if we are to retain a viable technology industrial base.

Let me at this early point congratulate you, Mr. Chairman, and your Committee for both your courage and wisdom in always finding a way to increase the requested amount of funding to a level that is necessary to adequately support the nation's solar thermal R&D effort. This year the courage required will be even greater, because DOE has requested only $15.3M, down from the $26.9M FY'86 funding level. The Committee on

Science & Technology in its authorization role has marked the $15.3M value up significantly to $22.0M. We urge this committee to go even higher to the $30.0M level so the nation can preserve its critical cadre of R&D teams in industry and the laboratories.

2.0 INDUSTRY CRITICAL JUNCTURE

The solar thermal power industry is at a critical juncture in its evolution. The DOE R&D budgets for solar thermal power have steadily declined for the last five years FROM $55M in FY 82 to a proposed $15.3M for FY 87, an amount that is really too small to maintain an effective cadre of talent. Table 1 below shows the solar thermal power budget for the last 7 years.

TABLE 1

FY 80 = $143.2M	FY 84 = $ 43.9M
FY 81 = $138.3M	FY 85 = $ 35.2M
FY 82 = $ 55.0M	FY 86 = $ 26.9M to $ 25.8M adjusted
FY 83 = $ 44.5M	FY 87 = $ 15.3M (proposed)

This rapid decline in the R&D budget plus the lapse or termination of solar tax credits has caused many companies to abandon their activities in solar thermal power work. Since 1981, thirty percent of the major companies involved in developing solar thermal technologies have discontinued their research activities in this field. The majority of these are large companies, mostly large diversified manufacturers. Their solar work formed only a small part of their overall operations.

The two most common reasons for ceasing activity in solar thermal technologies were the decline of federal funding for research and the diminishing near term marketability of the technology.

And now a new phenomenon has arisen to cause even more uncertainty in our industrial community, namely the "deferral list" - a process employed by the administration to defer funds already appropriated by Congress. Although this tactic has not been utilized in the solar

thermal budget items, the fact that it has been deployed in the photovoltaic FY'86 budget, makes for more uncertainty in our solar thermal FY'87 budget. We urge this committee to quash this "deferral tactic" especially on R&D items where, in many cases, industry has made significant commitments in time, money, and facilities based on appropriated funds, only to find out later that a given project was put in the "deferral box." How can industry work in good faith with the government if, in many cases, the government later backs off? In such cases, this process is just "bad business!"

3.0 INDUSTRY SURVEY CONCLUSIONS

SEIA has just completed an extensive survey and posture analysis of the solar thermal power industry. The conclusions reached from the study are most noteworthy and are cited below.

- It is clear that the current soft market for oil and gas dominate the environment in which our companies operate.
- There has been a major decline in the solar thermal industry in the last four years.
- The industry expects the decline to continue because no near-term market is in sight and DOE budgets have continued to fall.
- The industry has invested and is willing to continue to invest private funds in solar thermal research and development because it remains optimistic about the potential of these technologies.
- Industry believes that a strong federal role remains essential because of falling energy prices and high technical risks in certain areas.

The last item on the above list is the critical one ... industry needs a strong and adequate DOE R&D program. We should take advantage of the relatively "quiet energy period" (in contrast to the energy panic period of 1973 and 1979) while low oil prices prevail and perform our R&D to keep the industrial and laboratory teams together. These teams will develop improvements and innovations so as to bring solar energy systems low enough in cost to be competitive when oil prices start rising again.

4.0 THE U.S. NEEDS A STRONG SOLAR INDUSTRY

4.1 Some Key Issues

There are many reasons for developing a strong vibrant solar energy business. The key ones are:

- o Decrease dependency on imported oil with its negative trade balance.
- o Improve our environment with non-polluting solar energy. (Less smog, CO_2, and other wastes. The acid rain problem is finally becoming better understood and acknowledged ... the Canadian government is pushing hard for abating this international problem.)
- o Create many new jobs ... solar energy business is labor intensive.
- o Allow utilities to build plants in modular form and quickly (not 8 to 15 years for some coal and nuclear plants). LUZ Engineering Co., one of our member companies, installed a 30 MW electric power plant in ten months in 1985.
- o Create exports and help our trade balance ... most developing nations are in great need for non-polluting solar energy, and a healthy U.S. solar industry will generate many affordable export products.

4.2 Solar Thermal Key Applications

Solar thermal can play an ever increasing roll in meeting the country's industrial heat needs. Applications where solar input is matched to thermal requirements include many industrial process heat applications, such as:

- o Heat for batch processing such as canning and food processing,
- o Heat for desalination and waste water purification, and
- o Industrial cooling for buildings and processes.

The use of solar in these critical applications will help to make our food processing and other industries which use low grade industrial heat, more independent of the volatile world energy supply.

4.3 Solar Thermal Power Is Ideal For Utility Growth

Even though oil prices have dropped in the last two years (the cost of electricity in most places has continued to rise), it is still important to develop alternatives for electric power generation which are not dependent on fossil fuels and large nuclear plants. The solar thermal electric generating option does not increase the pollutant levels in the atmosphere or contribute to atmospheric carbon dioxide and also does not require a safe place to dispose of spent radioactive material. Solar provides a clean, environmentally safe, option for electric power generation. Recent advances in low-cost heliostat and point focus devices, together with higher system performances, have given solar thermal the potential to compete effectively with conventional electric generating capacity. Work on these technologies must be continued so that the utilities can evaluate the plants and their operating characteristics and determine how best to integrate them into the national electric generating mix. The utilities have learned, for example, that solar thermal electric systems with only a minimum of storage, beautifully match their peak loads.

4.4 Solar Thermal Power Can Improve The U.S. Balance Of Payments

Solar thermal is a high technology industry capable of supplying the heat and electricity that a growing world population will require. Many countries around the world, in excellent sunshine areas, desire clean renewable energy. Solar thermal power has the potential of becoming a large-scale export commodity. Should our government and industry not meet the challenge, solar thermal power could become a major import product shifting the balance of trade in the wrong direction.

4.5 Solar Thermal Power Can Improve the United States Economy

Solar thermal technology has the potential to provide two major benefits to the U.S. economy. The first is that jobs will be created in America and these jobs will represent Americans building energy systems for other Americans. The second benefit is that as Americans purchase and utilize solar energy systems, the demand for imported oil decreases and as this occurs, dollars which were leaving the country to pay for

imported oil would now stay in the country. Thus, solar energy can help increase the energy available to build the Gross National Product while reducing dollars paid for imported energy.

4.6 Solar Thermal Power Can Improve The United States Energy Image And National Security

The large scale implementation of solar technology which is dependent on the partnership between industry and government for its development will show the rest of the world that the United States is serious about gaining energy independence. Furthermore, it will provide evidence that the U.S. as a free society has chosen an energy option which will not pollute the atmosphere or toxify areas of the planet with high level radioactive waste in order to sustain economic growth. Large scale implementation will also make our communications and energy supply lines difficult to damage. We should always keep in mind, that by sinking a few tankers, an oil supply line can be cut off, and blowing up one strategic nuclear power plant could cripple a major portion of the country. Solar energy would be captured in a distributed way and therefore make individual companies and municipalities far less subject to interruption of energy supplies.

4.7 Solar Thermal Power Can Be Applied To Space Programs

The solar thermal technology will have major applications within National Defense and Space programs. Satellites and space stations of all types, communication, reconnaissance, and observation vehicles must have electric and thermal energy in order to function. This electric and thermal energy will no doubt be generated by solar thermal or photovoltaic systems. Solar thermal technology will be able to play a major role in the energy supply for satellite systems and space stations.

4.8 Solar Thermal Power Has Some Unique Characteristics

Solar electrical energy can be produced by either solar thermal power or, its sister technology, solar photovoltaics. For certain applications, one technology has advantages over the other, so each will be used where the fit is best. Since solar thermal power is generated by concentrators, it yields certain unique characteristics, namely (1) easy storage (merely store the working fluid that is being heated) and (2) attainment of extremely high temperatures, 2000°F to 5000°F or higher for solar engines, solar furnaces, or solar chemical reactions.

5.0 SOLAR THERMAL POWER TECHNOLOGY PROGRESS

Significant accomplishments were achieved in our technology during 1985 in both the federal and private sectors.

5.1 Federal Sponsored Programs

- Completed molten-salt electric experiment (MSEE).
- Completed Vanguard dish-Stirling project, with a record peak efficiency of 31.6% and an all-day efficiency of 25.2%.
- Completed Shenandoah total energy project test and operation phase and transferred facility to Georgia Power Company.
- Completed industrial process heat parabolic trough projects program.
- Selected contractors for small community solar experiments at Osage City, Kansas and Molokai, Hawaii.
- Awarded innovative dish concentrator and advanced heliostat contracts.
- Completed first year of the cooperative three year (1984-1987) power production phase at 10 MWe Solar One Pilot Plant, Barstow, California.

5.2 Private Sector Major Events

- LUZ SEGS I: Initiated operation of 14.7 MWe parabolic trough project at Daggett, California.
- LUZ SEGS II: Installed in only 10 months and started operation of the world's largest solar power plant, 30 MWe, at Daggett,

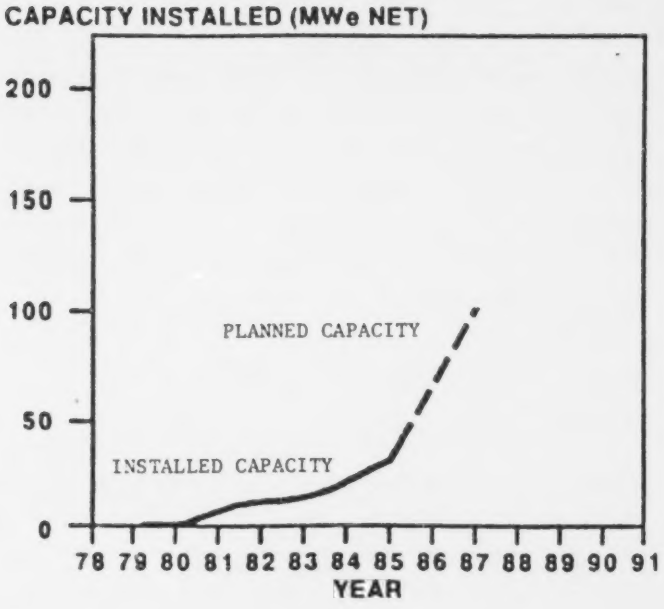
California.

- o LaJet Solar Plant 1: Initiated operation of 4.92 MWe parabolic dish project at Warner Springs, California.
- o McDonnell Douglas/United Stirling: Initiated prototype limited production of parabolic dish/stirling modules.

By far the most significant event cited above is the LUZ SEGS II solar power plant. In addition to being the world's largest solar power plant to date, it truly is the most significant step to commercialization. LUZ is planning to build two more 30 MWe plants, SEGS III and SEGS IV, prior to mid 1987, when the California solar tax credits expire.

5.3 Domestic Installed Capacity Trend

The chart below shows the domestic solar thermal power electric capacity installed to date and the near future planned capacity.



TOTAL DOMESTIC SOLAR THERMAL ELECTRICITY CAPACITY TREND

The trend line is very impressive, but it should be remembered that 45 MW of the installed capacity and 60 MW of the planned capacity comes from one corporation, namely LUZ. Furthermore, the financing for these solar power plants is made possible by use of the Federal and State Tax Credits, both of which are due to expire (the Federal credits may already be dead) and accelerated depreciation plus PURPA, which ensures that utilities will purchase the power.

The expiration of these favorable tax treatments is a key reason for a continuation of an adequate Federal R&D program ... let's make solar energy cost effective without the favorable tax treatments.

6.0 SUMMARY AND RECOMMENDATIONS

Solar research teams in industry, laboratories, universities, and utilities have evolved over 10 years and they have matured into effective working units with a good network of interaction and communication. Funding from the DOE, through such organizations as Sandia National Laboratories and SERI, have played a major roll in demonstrating the viability of industry's teams. Complementary government laboratory research has accelerated progress. The teams are enthusiastic and dedicated ... they would have to be after being "sifted and consolidated" through a continued budget reduction process since 1980.

The proposed budget recommendation of $15.3 would decimate these teams and many would disappear, as some have already done. It is important to remember that DOE has invested about $1 billion in Solar Energy over the years and that industry has invested an additional $200 to $300 million dollars; thus if the R&D teams disappear, then these major investments will be mothballed.

The Solar Thermal Power Industry 5-Year R&D Plan, which is complementary to and in support of the DOE multiyear R&D plan, calls for $40M per year funding. In the spirit of helping reduce the overall federal deficit, we have restructured the R&D plan to progress at a slower rate at $30M per year (collection technology = $14M, energy conversion technology = $6M, and systems & application technology = $10M).

In conclusion the solar thermal power industry makes the following budget related recommendations:

1. That the R&D funding level be continued at no less than $30M, about the average of the last 2 years funding. (We note that the total DOE budget has increased from $11.9716B in FY 86 to $12.1001B in FY 87, an increase of $128M, and that the proposed solar budgets have been cut in half.)

2. That should there be a tax on imported oil, which the majority of our members support, a portion of it be directed to solar thermal research to enhance the $30M to help assure earlier energy independence.

WEDNESDAY, APRIL 9, 1986.

URANIUM ENRICHMENT ACTIVITIES

WITNESS

FREDERICK C. DAVIS, SENIOR LEGISLATIVE AFFAIRS REPRESENTATIVE, EDISON ELECTRIC INSTITUTE

Mr. MYERS [presiding]. Next, Fred Davis, Senior Legislative Affairs.

Mr. DAVIS. Good afternoon.

Mr. Chairman and committee members, I am Fred Davis, Senior Legislative Affairs Representative of the Edison Electric Institute (EEI).

EEI is the national association of investor-owned electric companies. Its members serve approximately 73 percent of all ultimate electricity customers in the Nation.

They operate 82 nuclear plants and currently have 20 additional units under construction.

We concur with the proposed expenditures of the DOE in the fiscal year 1987 budget request for the uranium enrichment activity.

This includes funds for the advanced technology research on AVLIS, as long as AVLIS continues to offer expectations for lower costs for enrichment services.

However, we strongly oppose the implied concept that the Uranium Enrichment Enterprise owes a large amount of money to the Treasury for prior unrecovered costs.

GAO, OMB, and now DOE, in defining alleged unrecovered prior costs, have suggested approaches that do not properly allocate the prior program costs between military, non-proliferation and civilian purposes and do not appear to be in accordance with prior congressional direction on the program.

Thus, the $235 million payment to the Treasury appears to be based on an incorrect premise of a large outstanding obligation.

Any payment to the Treasury from the program should be made only after Congress has determined the basis for such payments.

EEI's members have been buying enrichment services from DOE for more than sixteen years, and they paid for these services on the basis of recovery of government costs.

There was no indication that some amount of additional government costs was to be carried forward and recovered at a future date.

Congress did not permit or require the uranium enrichment activity to establish a debt account that would suggest such an obligation.

Each year, Congress directed DOE to use the enrichment revenue to pay for operating costs, research and the expansion of production capacity.

The nuclear power utilities, and their electricity customers are the sole funders of DOE's Nuclear Waste Policy Act (NWPA) implementation.

This is currently at a rate of about $390 million per year from the one-mill per kilowatt hour charge with over $2 billion already paid by electric utilities.

This section of my statement focuses on four important elements of the nuclear waste disposal program: schedule, program control, defense waste funding, and the Integral Monitored Retrievable Storage Facility.

Congress included a realistic schedule in the NWPA, the first repository site recommendation is now set for March 1991—four years later than the time established by Congress.

Moreover, DOE has just issued the current OCRWM Annual Report indicating further slippages in other NWPA milestones.

The consequences of schedule delays will be increase program costs and erosion of the public confidence in the Federal Government's ability to dispose nuclear waste safely.

DOE should be urged to comply as closely as possible with the schedules established by Congress.

While DOE has made some progress in bringing centralized control over the program, we recommend that DOE take further steps to centralize management and coordination, and to perform systematic audits of contractors.

President Reagan made a decision on April 30, 1985 that high-level radioactive waste resulting from defense activities should be put in the same repositories with civilian waste.

However, the defense share of the cost has not been resolved, publicly discussed, or paid.

Our preliminary studies indicate that the fair and equitable share for defense wastes should be about 30 percent of the repository costs.

We urge Congress to insist that DOE take prompt action to have the Defense side pay their share and to do so in fiscal year 1986, or at the very least, starting in fiscal year 1987.

While the utilities have paid over $2 billion, the Defense side has paid nothing.

As directed by NWPA, DOE has prepared a proposal for an Integral Monitored Retrievable Storage Facility (I-MRS). We strongly support the need for an I-MRS as a part of the overall disposal system and support the budget request for work in fiscal year 1987.

On March 13, 1986, the EEI Board of Directors unanimously approved a resolution urging Congress to direct DOE to proceed with the I-MRS. The resolution is Attachment C to our written testimony.

The I-MRS would perform essential front-end functions that will have to be performed whether or not there is an I-MRS. However, locating these functions at the I-MRS will provide significant benefits to the overall nuclear waste disposal system.

Perhaps the greatest benefit of the I-MRS is that it would serve to focus the implementation of a significant part of the NWPA at the earliest possible time.

The clean-up of TMI-2 is progressing, and the fuel material is expected to be removed from the reactor by the middle of 1987. The investor-owned electric utility industry is providing $150 million toward the cleanup over a period of six years.

Continuation of Federal R&D support funding, in addition to the industry funding, is vitally important to the cleanup program and assuring that the maximum of R&D information is obtained.

We urge that Federal funding be continued to provide important knowledge for nuclear plant design, operation and decommissioning.

Thank you for the opportunity to present views of the electric utility industry on these civilian nuclear elements of the 1987 Budget Request of DOE.

You and Mr. Bevill have been very important allies of the congressional/federal powers invested in Congress through the NRC, and we appreciate the work and the language you have provided in committee reports and elsewhere to urge the Federal Energy Management Agency and the NRC to conduct tests for emergency planning around nuclear plants and most recently evidenced in the court decision in New York a few months ago which cleared the way for the test at Shoreham, and we believe without your help, and Congress, this would not have happened, and we think this is a good shot in the arm for the industry and allows that plant to open as we think it should.

Mr. MYERS. Thank you for your testimony. Thank you very much.

[The statement of Frederick C. Davis follows:]

Edison Electric Institute
Oral Presentation by
Fred Davis, Senior Legislative Affairs Representative
Subcommittee on Energy and Water Development
Appropriations Committee
U.S. House of Representatives

on the
Fiscal 1987 Nuclear Programs
Department of Energy

April 9, 1986

Mr. Chairman and Committee members, I am Fred Davis, Senior Legislative Affairs Representative of the Edison Electric Institute (EEI). EEI is the national association of investor-owned electric companies. Its members serve approximately 73 percent of all ultimate electricity customers in the nation. They operate 82 nuclear plants and currently have 20 additional units under construction.

I request that our written comments be included in the record of this hearing. I will provide an oral summary on three areas of the FY 1987 civilian nuclear program budget: the uranium enrichment activity, the nuclear waste program, and the funding for research in conjunction with the TMI-2 clean-up.

Uranium Enrichment Activity

We concur with the proposed expenditures of the DOE in the FY 1987 budget request for the uranium enrichment activity. This includes funds for the advanced technology research on AVLIS, as long as AVLIS continues to offer expectations for lower costs for enrichment services. However, we strongly oppose the implied concept that the Uranium Enrichment Enterprise owes a large amount of money to the Treasury for prior unrecovered costs.

GAO, OMB, and now DOE, in defining alleged unrecovered prior costs, have suggested approaches that do not properly allocate the prior program costs between military, non-proliferation and civilian purposes and do not appear to be in accordance with prior Congressional direction on the program. Thus the $235 million dollar payment to the Treasury appears to be based on an incorrect premise of a large outstanding obligation. Any payment to the Treasury from the program should be made only after Congress has determined the basis for such payments.

EEI's members have been buying enrichment services from DOE for more than sixteen years, and they paid for these services on the basis of recovery of Government costs. There was no indication that some amount of additional Government costs was to be carried forward and recovered at a future date. Congress did not permit or require the uranium enrichment activity to establish a debt account that would suggest such an obligation. Each year, Congress directed DOE to use the enrichment revenues to pay for operating costs, research and the expansion of production capacity.

Nuclear Waste Program

The nuclear power utilities, and their electricity customers, are the sole funders of DOE's Nuclear Waste Policy Act (NWPA) implementation. This is currently at a rate of about $ 390 million per year from the one-mill per kilowatt hour charge with over $2 billion already paid by electric utilities. This section of my statement focuses on four important elements of the

nuclear waste disposal program; schedule, program control, defense waste funding, and the Integral Monitored Retrievable Storage Facility.

Congress included realistic schedules in the NWPA, ~~However,~~ the first repository site recommendation is now set for March 1991-- four years later than the time established by Congress. Moreover, DOE has just issued the current OCRWM Annual Report indicating further slippages in other NWPA milestones. The consequences of schedule delays will be increased program costs and erosion of the public confidence in the Federal Government's ability to dispose nuclear waste safely. DOE should be urged to comply as closely as possible with the schedules established by Congress.

While DOE has made some progress in bringing centralized control over the program, we recommend that DOE take further steps to centralize management and coordination, and to perform systematic audits of contractors.

President Reagan made a decision on April 30, 1985 that high-level radioactive waste resulting from defense activities should be put in the same repositories with civilian waste. However, the defense share of the cost has not been resolved, publicly discussed, or paid. Our preliminary studies indicate that the fair and equitable share for defense wastes should be about 30 percent of the repository costs. We urge Congress to insist that DOE take prompt action to have the Defense side pay their share and to do so in FY 1986, or at the very least

starting, in FY 1987. While the utilities have paid over $2 billion, the Defense side has paid nothing.

As directed by the NWPA, DOE has prepared a proposal for an Integral Monitored Retrievable Storage Facility (I-MRS). We strongly support the need for an I-MRS as a part of the overall disposal system and support the budget request for work in FY 1987. On March 13, 1986, the EEI Board of Directors unanimously approved a resolution urging Congress to direct DOE to proceed with the I-MRS. The resolution is Attachment C to our written testimony. The I-MRS would perform essential front-end functions that will have to be performed whether or not there is an I-MRS. However, locating these functions at the I-MRS will provide significant benefits to the overall nuclear waste disposal system. Perhaps the greatest benefit of the I-MRS is that it would serve to focus the implementation of a significant part of the NWPA at the earliest possible time.

Three Mile Island Research Funds

The clean-up of TMI-2 is progressing and the fuel material is expected to be removed from the reactor by the middle of 1987. The investor-owned electric utility industry is providing $150 million toward the cleanup over a period of six years.

Continuation of Federal R&D support funding, in addition to the industry funding, is vitally important to the cleanup program and assuring that the maximum of R&D information is obtained. We urge that Federal funding be continued to provide important

knowledge for nuclear plant design, operation and decommissioning.

Thank you for the opportunity to present views of the electric utility industry on these civilian nuclear elements of the 1987 Budget Request of DOE.

Edison Electric Institute
Testimony Presented to
Subcommittee on Energy and Water Development
Appropriations Committee
U.S. House of Representatives

on the
Fiscal 1987 Civilian Nuclear Programs
Department of Energy

April 9, 1986

The Edison Electric Institute (EEI) is the national association of investor-owned electric companies. Its members serve approximately 73 percent of all ultimate electricity customers in the nation. They operate 82 nuclear plants and currently have 20 additional units under construction. These nuclear utilities hold the majority of the domestic uranium enrichment contracts with the Department of Energy (DOE) and they have nuclear waste disposal contracts with the Department. Utility payments to DOE during FY 1986 will be approximately $1.4 billion. The full costs of both programs are covered by utility payments.

Three areas of the Fiscal 1987 civilian nuclear program budget are of special concern to electric utilities operating nuclear power plants: the uranium enrichment activity, the nuclear waste program, and the funding for research in conjunction with the TMI-2 cleanup.

URANIUM ENRICHMENT ACTIVITY

We agree with the proposed expenditures of the DOE in the FY 1987 budget request for the uranium enrichment activity with the exception of the payment to the U.S. Treasury of $235 million. We strongly oppose the implied concept that the Uranium

Enrichment Enterprise owes a large amount of money to the Treasury for prior unrecovered costs.

Our position with regard to the recently proposed Uranium Enrichment Services Criteria published by DOE on January 29, 1986, that includes a section on "Recovery of Prior Unrecouped Government Costs", is provided in detail as our official comments to the DOE on February 28, 1986. A copy of these comments is provided as Attachment A to this testimony.

Congressional Direction

The initial Congressional intent for uranium enrichment is clearly expressed in the record of the Joint Committee on Atomic Energy. Significant guidance was provided in a letter of October 18, 1966 from Chet Holifield, Chairman of the Joint Committee, to Dr. Glenn T. Seaborg, Chairman of the Atomic Energy Commission. The following quote is from that letter.

> "We recognize that accounting procedures applying to facilities which were constructed for and devoted to military production and now used for civilian nuclear fuel production, necessarily cannot follow standard industrial or Government procedures in all respects."

In a letter of August 10, 1984, from the General Accounting Office to Congressmen Dingell and Ottinger it is stated:

> "DOE is not required to have a formal plan for repaying the Treasury for the government's cost of providing uranium enrichment services, nor does the legislative history indicate that the Congress intended the programs to make specific repayments to the Treasury as is the case for some other programs."

Each and every year since 1969, Congress has reviewed and approved the uranium enrichment services budget, and at no time

did Congress indicate that prior costs were being accumulated to be recovered at some later date. Congress did not permit or require the uranium enrichment activity to establish a debt account that would suggest such an obligation. Each year, Congress directed DOE to use the enrichment revenues to pay for operating costs, research and the expansion of production capacity.

In other instances where the Government provides services, Congress specifically permitted the establishment of debt. This was permitted for the Tennessee Valley Authority, for Power Marketing Agencies, and was even permitted for the Nuclear Waste Program. This clear distinction of not permitting the enrichment activities to establish a debt account appears to have defined the intent of Congress. Congress did not believe a debt was being accumulated by the enrichment activities. They did believe appropriate costs for enrichment services were recovered in the prices charged by the Government.

Major New Basic Policy

The Administration is requesting a major change in the basic policy. This new approach does not reflect the understanding of the domestic commercial customers who have taken delivery of enrichment services over the past sixteen years. Prices were set each year on the basis of recovery of Government costs and the customers paid for the services on that basis. There was no indication that some amount of additional Government costs was to be carried forward and recovered at a future date.

As a program accounting decision, the DOE has proposed the reduction of $4 billion from the Government investment account, as a write-off of plant capacity that will not be used in current or future enrichment operations. This accounting step appears to be appropriate. After the write-off, the remaining value of about $3.5 billion may be an appropriate value of the net assets, which includes very large inventory values. However, this should not be viewed as "prior unrecovered Government costs" that are to be paid to the U.S. Treasury. If a payment to the Treasury is to be established, it would be more appropriate to base the payment on a percentage of future net income, similar to conventional business practice.

Basis for the Presumed Prior Unrecovered Government Costs

The U.S. General Accounting Office (GAO) has evaluated the uranium enrichment program in detail and provided its views on what it considers to be the "government's unrecovered enrichment costs". It has suggested a methodology that does not recognize an appropriate allocation of the costs for purposes other than to serve commercial customers, and does not recognize the actions of Congress in its annual budget reviews. Specifically, GAO defines the total government cost as the sum of; (1) the government's initial investment in the program, (2) all appropriations, and (3) imputed interest. This simplistic methodolgoy appears to ignore or inappropriately dispense with the following:

- Direction provided by the Joint Committee on Atomic Energy to the Atomic Energy Commission when the initial criteria were established and subsequently modified,
- Annual Congressional direction provided during the budget reviews each year in which Congress directed the

Administration to use program revenues to offset operating expenses, perform research and to expand the production capacity,

- The lack of Congressional authority to establish a debt account for the enrichment activity that would recognize any unrecovered government costs,
- The initial government investment set up on the books in 1970 was paid for in prior years by the Nation's taxpayers for military reasons,
- Appropriate allocation of costs that were incurred for military purposes,
- Appropriate allocation of costs that were incurred for non-proliferation/National Security reasons, and
- Program Appropriation values that were not actually spent by the Administration in the enrichment program.

The DOE and the Office of Management and Budget (OMB) appear to have taken a distinctly different approach to the newly defined "prior unrecovered Government costs". They apparently started with the line item in the Uranium Enrichment Activity Annual Report called "Government Investment" and redefined this line item as "prior unrecovered Government costs". In prior years, the Government Investment was shown as the value of the total assets minus total liabilities. This value should not be equated to "prior unrecovered Government costs." The approach by DOE and OMB does appear to properly address the need to write-off the value of the plant that will not be used in current or future enrichment operations. However, like the GAO approach, it appears to improperly dispense with the first six items listed above under the GAO approach.

If Congress believes that some amount of prior unrecovered Government costs does exist, and payments are to be made to the U.S. Treasury, it should review the GAO and DOE/OMB methodologies

carefully in light of the above concerns. A sound approach that recognizes the intent of prior Congresses may be to create each year a Statement of Operations on the basis of Generally Acceptable Accounting Principles, showing the military, national security, commercial customer, and any other critical elements in separate columns. Such a statement would provide valuable guidance essential to an equitable cost allocation. The date on the Statement of Operations would provide key facts required for calculation of a current value on an earnings basis, and the deficits, surpluses etc., which might be relevant at any time.

An alternate approach to arrive at some value for prior unrecovered costs applicable to civilian customers, that appears to be more reasonable and supportive, is to subtract the civilian revenues received each year over the period of 1969 through 1984 from the enrichment program outlays during each year. Also, an appropriate full cost of production for the defense products should be assigned for each year. This approach defines the total outlays over the period from 1969 through 1984 as $14,880 million and the total civilian revenues as $13,320 million, leaving a net difference of $1,560 million over the sixteen year period. When appropriate production costs are assigned for defense materials, they have a value of about $1,430 million over the period. Without providing any other allocation of costs, such as facility expenditures required for safeguarding the military's high enriched uranium or the carrying cost of inventory provided for international non-proliferation/national policy reasons, the difference between $1,560 million and $1,430

illion, is $130 million that may be assigned as net outlays for civilian service activity. Since these outlays occurred in different years over the sixteen year period, it is appropriate to calculate an imputed interest value on the yearly outlays. This results in an imputed interest value of $220 million. The sum of the $130 million civilian outlays and the imputed interest thereon of $220 million provides a total of $350 million for civilian outlays plus interest.

As previously noted, the above analysis does not recognize the fact that specific facility expenditures were required for safeguarding high enriched uranium produced for military purposes. Additionally, no recognition was given for the costs associated with the Government's non-proliferation/national security policies. In fact, if these costs were properly recognized, it could be concluded that the revenues from civilian customers for enrichment services exceeded the costs of providing the service and were used to subsidize the defense and non-proliferation policies of the Federal Government.

If Congress decides that the Enrichment Activity should make future payments to the Treasury, it must also recognize that the U.S. enrichment program is now serving an internationally competitive market and the dynamics and the economics of that market will dictate the prices that can be charged for enrichment services. Any program for paying money to the Treasury must be part of a broader plan to allow DOE to price their services competitively.

Advanced Technology Research

We support DOE efforts to develop advanced technologies for enrichment, as long as developments are based on realistic prospects for ultimately lowering the cost of enrichment services. It is important that DOE carefully and consistently monitor its research and development projects specifically to assure that the goal of lowering costs will be met, and require prompt program adjustments if a research project cannot be expected to meet that goal. The research work now being performed on the Advanced Vapor Laser Isotope Separation (AVLIS) process appears to offer reasonable expectations for lower costs, and we support that effort on a modest basis with appropriate scale up steps so long as it continues to offer such expectations. This technology will require a substantial amount of time and funding to demonstrate an economically satisfactory concept. Thus, it is highly unlikely that non-government funding will be forthcoming to support such a demonstration.

NUCLEAR WASTE

The success of DOE's implementation of the Nuclear Waste Policy Act of 1982 (NWPA) is vital to the nation's nuclear power utilities. It is the nuclear power utilities and their electricity customers that presently fund the nuclear waste program at an annual rate of approximately $390 million by way of the one mill per kilowatt-hour fee imposed on the utilities. Thus, the nuclear utilities are concerned about the cost of the program to their customers and have a vital interest in its successful, timely, and cost effective implementation.

DOE is moving forward on its implementation of the NWPA. Our comments today are not so much a criticism of DOE's efforts -- much of what has been accomplished thus far is commendable -- as a discussion of several issues that must be addressed to meet the intent of Congress when it enacted the NWPA.

In this section of our testimony, we focus on only four of the issues that we believe are important to the overall success of the nuclear waste program:

- o Schedule delays
- o DOE fiscal management and cost control
- o Cost allocation for defense wastes
- o Integral Monitored Retrievable Storage

Schedule Delays

The NWPA includes detailed schedules for federal actions needed to meet the Act's objectives. These schedules were not peripheral to the Act but were the central method chosen by Congress to achieve the availability by 1998 of the first geologic repository. One of the Act's purposes is "to establish a schedule for siting, construction, and operation of repositories that will provide a reasonable assurance that the public and the environment will be adequately protected from the hazards posed by high-level radioactive waste and such spent fuel as may be disposed of in a repository...." (42 U.S.C. §10131) Congress in 1982 believed the schedules established were "realistic and workable" and fully expected "the involved agencies to do everything possible to assure that [the] schedule is met." (S. Rep. No. 282, 97th Cong. 1st Session) Unfortunately, missed deadlines

and schedule slippages have become the rule for the nuclear waste program.

Section 114(e) of the Act requires DOE to prepare a Project Decision Schedule setting forth "the optimum way to attain the operation of the repository involved, within the time periods specified" and to report to Congress any failure of a federal agency to comply with a deadline. DOE has not complied with Section 114(e) of the Act. The July 1985 draft Project Decision Schedule neither reflects the statutorily-mandated schedules nor DOE's schedule problems. Rather, the draft Project Decision Schedule establishes the "reference schedule" for repository site recommendation at March 1991 -- four years later than the deadline established by Congress in the Act. Furthermore, we note that in the recently issued OCRWM Annual Report to Congress (DOE/RW-0004/2, March 1986) DOE indicates additional milestone slippages.

We urge this Subcommittee to encourage DOE to comply as closely as possible with the schedules established by Congress and to set forth the optimum means for compliance with the deadlines established in the Project Decision Schedule. DOE should fully comply with Section 114(e) and report to Congress all schedule problems, including those of its own making. DOE should report both actual and potential schedule problems and to submit for congressional information the means proposed to correct or compensate for factors inevitably leading to schedule slippage.

The consequences of schedule delays are significant. Program cost will increase and public confidence in the federal government's ability to manage nuclear waste disposal will erode. To avoid these impacts, we are encouraged to see that DOE has made some progress in developing and exercising greater centralized project management over the entire nuclear waste program and by placing greater emphasis on program controls to ensure that current schedules are maintained.

DOE Fiscal Management and Cost Control

The most recent estimates of the cost of the nuclear waste program are between $24-$34 billion. The NWPA directed that these costs be paid by those who benefit from the use of nuclear energy -- the owners and operators of civilian nuclear power reactors on the one hand and the United States atomic energy defense programs on the other. The fee for commercial power reactors is one mill per kilowatt-hour on all electricity generated and sold from commercial nuclear power plants. In addition, DOE has received a major portion of the $2.3 billion for the one-time fee payments for spent fuel generated prior to April 7, 1983.

Thus, electricity consumers are now paying for services that the federal government has promised to provide at some future time. We are concerned that DOE has yet to establish a systematic approach for controlling the costs of these services. For example, eighty-five percent of the cost of the nuclear waste program is spent on contractors and subcontractors, yet DOE has

not established effective centralized management control over program contracts. Our concerns are shared by the National Association of Regulatory Utility Commissioners.

While DOE has made some progress in this area, we would recommend that DOE continue taking steps to establish increased management control and fiscal accountability for the waste management program in the following areas:

- Establish centralized DOE management for strategic planning, policy guidance, fiscal and schedule control, and coordinating all involved federal agencies.
- Perform systematic and continuing audits of contractors and subcontractors, as suggested by GAO.
- Establish, by rulemaking, clear and specific DOE guidelines for grant applications by States and Indian Tribes for both the first and second repository in accordance with the December 2, 1985 court decision in Nevada v. Herrington.

Cost Allocation for Defense Wastes

A Presidential decision on April 30, 1985 defined that high-level radioactive waste resulting from atomic energy defense activities and civilian spent fuel and waste should be disposed of in the same geologic repositories. However, DOE has not, despite our requests, involved the affected utilities in its consideration of cost allocation or acceptance schedule impacts that this decision creates. The proper allocation of costs between civilian and defense wastes is a multi-billion dollar issue. The acceptance schedules for defense wastes may well have a significant impact on the civilian spent fuel backlog. DOE treats this important issue with a non-committal statement in its Mission Plan:

> "Negotiations are underway with other DOE offices to both establish an equitable cost-sharing method and to develop a waste acceptance schedule that integrates the two major waste streams.

Similarly non-committal statements are made in the recent Annual Report.

The utilities share the concerns expressed by the National Association of Regulatory Utility Commissioners that these internal negotiations between the DOE Division of Defense Programs and DOE Office of Civilian Radioactive Waste Management may be no more than an exercise in creative accounting to justify that the lowest possible cost is allocated to defense wastes. We are concerned that an equitable and realistic basis for cost sharing will not evolve, especially since DOE's overriding interest may be to minimize the direct impact on its appropriated budget for defense activities.

We ask this Subcommittee to urge DOE to pursue an open process that would involve the utilities directly in the consideration of an equitable cost-sharing approach. The utilities and their customers are the real parties of interest. We have offered to work with DOE to develop a reasonable cost allocation formula. The results of this process should be subject to public comment and Congressional scrutiny -- especially since Congress will have to authorize the Waste Fund payments for defense waste disposal. We understand that DOE is planning to issue a proposed rule for public comment as one step in determining the defense waste cost allocation. This will be a step in the right direction.

The defense waste cost allocation issue has two aspects: the allocation formula and the timing of payments to the Waste Fund. One suggestion being considered by DOE would base the defense waste share on the percent of the total curie content of waste at the time of disposal. The one mill per kilowatt-hour fee for civilian spent fuel, however, is essentially a fee on the total curie content at the time of discharge from the reactor core. Thus, an allocation based on the total curie content at disposal would credit defense waste with radioactive decay without allowing any such credit to civilian spent fuel. This would give DOE's defense programs a substantial "free ride" at the expense of electric utilities and their customers.

The utilities submit that an appropriate cost allocation approach should be based on the primary characteristic DOE utilized to justify commingling defense and civilian waste -- cost savings. Cost savings resulting from the combined operations -- compared to the overall cost of separate disposal systems -- should be shared in proportion to the cost estimate for the separate facilities. We describe this approach in more detail in Attachment B of this testimony.

Our preliminary analysis concludes that defense waste should bear about one-third of the cost of the geologic repository program. The nuclear industry is not looking for a subsidy from the defense side, nor do we desire to subsidize them. We look forward to working with DOE in developing a reasonable and equitable arrangement, which under any outcome must be subjected to broad public and Congressional scrutiny.

The timing of payments into the Waste Fund for defense wastes should be comparable to commercial payments. A one-time fee, similar to that required by the utility contracts, should be paid into the Waste Fund for all defense waste generated prior to April 7, 1983 in a manner similar to the civilian payments and should appropriately include interest, again similar to the interest requirements imposed on utilities. As mentioned earlier, the utilities commitment for pre-April 7, 1983 spent fuel is about $2.3 billion and a majority of this was paid in 1985. The defense side must make a proportionate payment to ensure equitable treatment. Fees for current defense wastes should be paid quarterly similar to electric utilities -- according to an equitable billing formula.

It is ironic that it took DOE only 6 months to promulgate and implement the complicated contractual arrangements -- including the fee structures -- for commercially generated spent fuel and high level waste. Yet, more that three years have elapsed since the Act was passed and DOE Defense Programs has not made a single payment for the expenses of the DOE Office of Civilian Radioactive Waste Management. We urge Congress to insist that DOE take prompt action to correct this inequity with payments starting in FY 1986, or at the very least, in FY 1987.

Integral Monitored Retrievable Storage (I-MRS)

The NWPA directs DOE to develop and present to Congress a proposal for a Monitored Retrievable Storage (MRS) facility, but

Congress reserved for itself the final decision on whether the nuclear waste program should include the MRS. DOE's Improved Performance Plan as proposed in its June 1985 Mission Plan, includes an Integral MRS (I-MRS). We strongly support the I-MRS and are pleased to note that on March 13, 1986 the EEI Board of Directors unanimously approved a resolution supporting the I-MRS. A copy of the resolution is Attachment C to this testimony. It urges Congress to direct DOE to proceed with the I-MRS and to implement the Improved-Performance Plan described in the June 1985 Mission Plan.

The I-MRS concept envisions a facility that would perform essential nuclear waste disposal functions. These include spent fuel acceptance, rod consolidation and spent fuel packaging. The I-MRS would also provide a limited amount of spent fuel storage. These front-end functions must be performed whether or not there is an I-MRS. However, locating these functions at the I-MRS, would provide significant benefits to the overall nuclear waste program. Front-end repository function designs, licensing and construction would be removed from the critical path for the first repository. This would allow DOE (and NRC) to concentrate the repository program on critical repository issues, such as emplacement, licensing and post-closure concerns. The I-MRS would make the nuclear waste disposal program less sensitive to delays in the schedule for the initial repository, because it would provide a limited amount of storage for spent fuel, away from the repository, that is ready for disposal.

Other significant benefits from the I-MRS include improvements in the waste transportation system. The I-MRS would result in a reduction in the number of nuclear waste shipments to the repository. It would also allow DOE to address transportation-related issues at an earlier stage than the siting of the initial repository.

Perhaps the greatest advantage to the nuclear waste program for including an I-MRS would be the requirement to mobilize DOE's design, licensing and construction forces several years before they would be required for a repository-only program. This would serve to focus DOE's implementation of a significant part of the NWPA at the earliest possible time. Such early focus for at least a portion of the program is essential given the extended duration of the overall program and the enormous costs involved.

DOE has indicated the net incremental cost of implementing the I-MRS could be as high as $2 billion. We believe that when DOE fully incorporates the I-MRS in its optimum system arrangement, I-MRS implementation will result in a decrease in the net cost of the overall program. Even if overall costs are not quantifiably reduced, the I-MRS cost estimate is, at most, about 6-8 percent of the total waste program cost and well within the estimated margin of error of the current overall program estimate.

We strongly urge Congress to approve the I-MRS to maximize benefits for the utilities and the overall implementation of the nuclear waste program. In order to maximize benefits for utility storage planning, we also request Congress to permit I-MRS

acceptance of a significant quantity of spent fuel, prior to construction authorization of the first repository.

THREE MILE ISLAND RESEARCH FUNDS

The clean-up of TMI-2 is progressing and the damaged fuel material is expected to be removed from the reactor by the middle of 1987.

The investor-owned electric utility industry is providing $150 million toward the cleanup over a period of six years.

Continuation of Federal R & D support funding, in addition to the industry funding, is vitally important to the cleanup program and to assure that the maximum of R & D information is obtained. We urge that Federal funding be continued to provide important knowledge for nuclear plant design, operation and decommissioning.

Thank you for the opportunity to present views of the electric utility industry on these civilian nuclear elements of the 1987 Budget Request of DOE.

ATTACHMENT A TO TESTIMONY OF EDISON ELECTRIC INSTITUTE
APRIL 9, 1986

JOHN J. KEARNEY, Senior Vice President

EDISON ELECTRIC INSTITUTE The association of electric companies

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February 28, 1986

U.S. Department of Energy
NE-34, Room A-172, GTN
Germantown, Maryland 20545

Comments on Proposed Uranium Enrichment Services Criteria (51FR3624)

Dear Sirs:

The Edison Electric Institute (EEI) offers for your consideration the enclosed comments on the proposed Uranium Enrichment Services Criteria, and requests an opportunity to speak at the public hearing on the proposed criteria on March 18-19, 1986.

EEI is the national association of investor-owned electric companies. Its members serve approximately 73 percent of all ultimate electricity customers in the nation. They operate 82 nuclear plants and currently have 20 additional units under construction. These nuclear utilities hold the majority of the domestic uranium enrichment contracts with the Department of Energy (DOE).

The U.S. enrichment services activity must be run on an efficient basis that recognizes the realities and the economics of a very competitive international market. It is appropriate to adjust the activity, by such steps as revising the criteria, to accommodate this market. Some sections of the proposed criteria provide flexibility needed in the program, and we support such modifications. However, some of the changes clearly are unacceptable and we urge DOE to review carefully our comments in this regard.

The proposed criteria represent significant and substantial changes over the existing criteria. Our specific comments are contained in Enclosures 1 and 2 to this letter. Enclosure 1 deals in detail with the issue of the recovery of alleged prior unrecovered Government costs. That aspect of the proposed criteria represents a major, fundamental change to the policy under which the enrichment activity operates. If adopted, it would raise serious questions concerning the validity of all existing and prior DOE contracts. Enclosure 2 provides section-by-section comments on the remainder of the issues covered by the proposed criteria.

Providing future payments to the U.S. Treasury, using sound and supportable accounting principles that are applied on a prospective basis, may be appropriate. Under any such approach, the cost of the program should be properly allocated among the entities and functions served: civilian, military, non-proliferation/national security, and any others. This would constitute a new policy and should be reviewed in detail by the Congress and the public before being adopted.

We appreciate this opportunity to submit our views on the proposed uranium enrichment services criteria. We would be glad to discuss them in greater detail at the public hearing.

Sincerely,

John J. Kearney

JJK:spt
Enclosures

Enclosure 1

EDISON ELECTRIC INSTITUTE
COMMENTS ON 10CFR PART 762
DISCUSSION OF THE PROPOSED
RECOVERY OF PRIOR UNRECOUPED GOVERNMENT COSTS

The new policy proposed in 10CFR Part 762, section 762.6, Recovery of prior unrecouped Government costs, is inappropriate and unacceptable. Including such a section in the new criteria would call into question the validity of all contracts for enrichment services offered by DOE because of the basic and significant change from the established policy in place when all existing and prior contracts were signed.

The electric utility industry does not accept DOE's premise that the enrichment program for civilian customers has accumulated unrecovered prior costs of $7,522 million or that future prices for civilian services should reflect any portion thereof to provide funds for "repayment" to the U.S. Treasury. It does appear to be appropriate to reduce the Government investment account by $4,065 million by writing off plant capacity that will not be used in current or future enrichment operations. This would result in a new value of $3,457 million for the Government investment. However, this should not be identified as an unrecovered prior cost to be paid to the Treasury. As specifically stated on page 8 of the letter dated August 10, 1984, from the General Accounting Office to Congressmen Dingell and Ottinger: "DOE is not required to have a formal plan for repaying the Treasury for the government's cost of providing uranium enrichment services, nor does the legislative history indicate that the

Congress intended the program to make specific repayments to the Treasury as is the case for some other programs."

The Edison Electric Institute strongly disagrees with the proposed new policy embodied in Section 762.6 for the following reasons:

1. Congress never authorized a debt account for the enrichment activity.

Congress did not require or permit the program to carry forward unrecovered costs to be paid at some future date. Congress established the program to provide enrichment services for civilian customers as one step specifically taken to encourage the healthy development of the nuclear industry. When the Atomic Energy Commission proposed the original Uranium Enrichment Services Criteria in 1966, the criteria were reviewed in detail during five full days of hearings before the Joint Committee on Atomic Energy. Subsequent changes were made in the criteria during the period from 1970 to 1974, each time after several days of hearings before the Joint Committee.

Congress recognized that a portion of the depreciation and interest on the facilities should be referred to in establishing the prices for civilian customers. However, in each and every year after 1969, Congress reviewed and approved the uranium enrichment services budget and did not indicate at any time that any amount of prior costs was

being accumulated to be recovered at a later date. Congress directed the DOE to use the revenues received from the sale of enrichment services to its civilian customers to pay for operating expenses, research, and expansion of production capacity. Thus, customer revenues provided the funds to pay for increased Government investment.

At no time did Congress permit or require the uranium enrichment activity to establish a debt account that would suggest an ongoing repayment obligation. In other instances where the Government provides services, Congress specifically permitted the establishment of debt. This was permitted for the Tennessee Valley Authority, for public power districts, and for the Nuclear Waste Program. This clear policy of not permitting the enrichment activities to establish a debt account defines the intent of Congress that costs were not permitted to be carried forward and recovered at some future date.

2. Retrospective establishment of an amount for "prior unrecouped Government costs" is inappropriate.

No policy of carrying an amount for "prior unrecovered Government costs" was in effect during the first sixteen years of program operation, and no logic, accounting support, or other justification for this major policy change has been presented. This new concept does not reflect the understanding of the domestic civilian customers that have

purchased enrichment services over the past sixteen years.

Prices for enrichment services were set each year by DOE and its predecessor organizations on the basis of recovery of appropriate Government costs over a reasonable period of time. The customers paid for the service on that basis. There was no indication that some amount of additional Government costs were to be recovered at a future date. For DOE suddenly to determine that such costs do exist, through making an evaluation on a retrospective basis, is inappropriate, unwarranted and unacceptable.

3. Civilian customers should not have to pay for military facilities which have fulfilled their primary purpose. The first separate financial report of the uranium enrichment activity was published as the Financial Statement for the Fiscal Year Ending June 30, 1971, with opening balances established as of June 30, 1970. The initial opening balance for the Government investment line item was approximately $1.5 billion, including physical plant, pre-produced inventory, and working capital. This investment had been made for military purposes and had been paid for in full prior to June 30, 1970. There was no indication that this initial Government investment was considered to be an unrecovered prior cost when the activity was initiated.

The initial value of the uranium enrichment physical plant as transferred to the uranium enrichment activities on June 30, 1970 was established at approximately $1 billion. This physical plant had been constructed at three locations over the period of the 1940s, 1950s, and 1960s, strictly for military production purposes. When the facilities were built, they were paid for by taxpayer dollars and were not justified as facilities to be used to provide enrichment services for civilian customers. However, they were productive facilities, and when the military needs decreased, they were made available to provide civilian enrichment services as one element of the Government effort to encourage the commercial use of nuclear energy. When the value of the physical plant was established for book purposes, Congress was well aware that the plant appropriately had been paid for by the taxpayers. Now, after the program has operated for over 16 years, it is inappropriate that a new policy should call for the payment a second time by electricity ratepayers.

The pre-produced inventory and the working capital were assigned an initial value of approximately $450 million as of June 30, 1970. The excess inventory was expected to be sold in the normal course of business.

4. Inventory costs incurred for purposes other than to serve civilian customers should not be charged to civilian customers.

Approximately $2 billion of the $3.5 billion that is referenced as the "prior unrecovered Government costs" represents an existing inventory of SWUs and uranium. These are saleable commodities, most of which were accumulated for the convenience of the Government, with only a minor portion needed to serve the civilian customers. Since much of this large inventory was not needed in the past and is not needed now to serve civilian customers, its costs, and the imputed interest thereon, should not be charged as a cost component to present-day civilian customers. These surplus saleable products should be placed in a strategic stockpile, or they should be sold. In any event, the surplus inventory and the accumulated imputed interest thereon should not be used as a component of the Government investment for calculating the imputed interest for the civilian enrichment activity.

While there is a need for some reasonable inventory to assure the timely delivery of product to customers, the inventory should be in the range of 120-180 days of projected demand. The pre-produced inventories, both before 1970 and since, have been much larger than that needed for a reasonable operating inventory to serve the civilian customers. Actually, in 1980 the finished inventory was greater than three times annual sales, equivalent to six to twelve times the level of a reasonable operating inventory. This large inventory was built for several purposes: to

make anticipated future sales that did not materialize, to satisfy military needs, and to serve non-proliferation/ national security goals.

Even though the inventory was much larger than appropriate for normal commercial business inventory practices, the costs of the inventory and the imputed interest thereon were included in establishing the price for the civilian customers. This additional cost was not necessary to provide enrichment services to civilian customers and should not have been so assigned. A reasonable inventory for serving today's commercial customers is, at most, 5 million SWUs, compared to the actual inventory of over 15 million SWUs. In 1978, 1979 and 1980, the inventory exceeded 35 million SWUs -- clearly in excess of any reasonable operating inventory. In testimony before Congress in 1980 when the inventory was greater than 35 million SWUs, DOE indicated that the desired reasonable operating inventory was 9 million SWUs and that an additional 5 million SWUs should be set aside for non-proliferation purposes. This was the period when President Carter asked for large inventories for national security reasons. Thus, a substantial portion of the pre-produced SWUs and the uranium feed material inventories were established for reasons certainly not related to the civilian business. Yet the cost of and the imputed interest on those large inventories were assigned as a cost to civilian customers, and are now

included as part of the alleged "prior unrecovered Government costs".

5. The approaches used by GAO and DOE to define "prior unrecovered Government costs" fail to recognize either Congressional intent or the history of the program.

The GAO has evaluated the uranium enrichment program in detail and has provided its views on what it considers to be the "Government's unrecovered enrichment costs". It has suggested a methodology that is simple and straightforward, but it does not recognize an appropriate allocation of the costs for purposes other than to serve civilian customers, and it does not recognize the actions of Congress in its annual budget review. Specifically, GAO defines the total government cost as the sum of: (1) the Government's initial investment in the program, (2) all appropriations, and (3) imputed interest. This simplistic methodology ignores or inappropriately dispenses with:

- Direction provided by the Joint Committee on Atomic Energy to the Atomic Energy Commission when the initial criteria were established and subsequently modified,

- Annual Congressional direction provided during the budget reviews each year in which Congress directed

the Administration to use program revenues to offset operating expenses, perform research, and expand the production capacity,

- The fact that Congress has never authorized a debt account for the enrichment activity that would recognize any unrecovered government costs,

- The fact that the initial government investment set up on the books in 1970 was paid for in prior years by the Nation's taxpayers for military reasons,

- An appropriate allocation of costs that were incurred for military purposes,

- An appropriate allocation of costs that were incurred for non-proliferation/national security reasons, and,

- Program appropriation amounts that were not actually spent by the Administration in the enrichment activity.

The DOE appears to have taken a distinctly different approach to establish the newly defined "prior unrecovered Government costs". It apparently started with the line item in the Uranium Enrichment Activity Annual Report called "Government Investment" and redefined this line item as "prior unrecovered Government costs". In prior years, the

Government Investment was shown as the value of the total assets minus total liabilities. This value should not be equated to "prior unrecovered Government costs." Like GAO, DOE appears to improperly dispense with the first six items listed above under the GAO approach.

Appropriately, a reduction of $4,065 million is taken by DOE as a write-off of plant capacity that will not be used in current or future enrichment operations. After the write-off, the remaining physical plant, inventory, and working capital are assigned a value of $3,457 million. This may be an appropriate value of the net assets. However, this should not be viewed as "prior unrecovered Government costs" that are to be paid to the U.S. Treasury. Any obligation to make payments to the Treasury should be recognized as something quite different from the value of the net assets.

6. <u>The proposed criteria may call into question the validity of all DOE enrichment contacts with civilian customers</u>. Customers who are now, or who were previously, a party to contracts with DOE or its predecessors, including the Utility Services Enrichment Contract as well as earlier Requirements and Fixed Commitment contracts, did not enter into <u>any</u> of these contracts with the understanding that "In establishing prices for providing enrichment services for civilian customers" DOE would subsequently attempt to "establish reserves sufficient to return to the Treasury of

the United States, over a reasonable period of time, previously unrecouped and unrecovered costs associated with provision of enrichment services to civilian customers." In fact, it had always been represented that the prices being charged for enrichment services under each of these contracts were sufficient to recover "appropriate Government costs" as required by the criteria.

7. Any determination of future payment to the Treasury must be based on a reasonable, annual comparison of appropriate Government costs with civilian revenues collected over the years.

If the intent of the Congress is to have the enrichment activity start making payments to the Treasury in the future, then the Congress needs to specify this along with the basis upon which such payments should be determined. In such a case, the approach taken should be developed using sound and supportable accounting principles, and should consider the dynamics and economics of the international competitive market that exists today to ensure that DOE will not be priced out of the market by trying to collect an alleged accumulated debt.

If some amount of prior unrecovered Government costs is determined to exist, and payments are to be made to the U.S. Treasury, the approach taken to define the value of such costs should be determined by using sound and

supportable accounting principles. A sound approach that would recognize the intent of prior Congresses may be to create, for each year, a Statement of Operations on the basis of Generally Accepted Accounting Principles, showing the military, national security, civilian customer, and any other elements in separate columns with supporting details. Such a statement would provide valuable guidance essential to an equitable allocation of cost. The Statement of Operations and supporting data should provide the principal facts required for calculation of a current value on an earnings basis, and the deficits, surpluses, etc., which might be relevant at any time.

After properly applying Generally Accepted Accounting Principles, and recognizing the concerns expressed above, the relevant appropriate costs for serving the civilian customers should be compared with the revenues from the civilian customers. Such a comparison may well lead to the conclusion that all costs that were incurred to serve civilian customers have been fully recovered.

Enclosure 2

EDISON ELECTRIC INSTITUTE
SPECIFIC COMMENTS PERTAINING TO THE
PROPOSED URANIUM ENRICHMENT SERVICES CRITERIA
DATED JANUARY 29, 1986 (10 CFR PART 762)

762.1 General

(a) Authority

Authority does not appear to exist for the proposed section 762.6, Recovery of prior unrecouped Government costs. "... Section 161(v) of the Atomic Energy Act of 1954, as amended, does not include a repayment requirement but instead requires DOE to recover the government's costs of providing enrichment services." August 10, 1984 letter from J. Dexter Peach, of the United States General Accounting Office, to Congressmen Dingell and Ottinger.

(b) Eligible customers.

Acceptable.

(c) Capacity limitations.

This provides DOE with the appropriate flexibility to contract for enrichment services.

(d) Sales limitations.

Acceptable.

(e) Revision of criteria.

Acceptable

762.2 Definitions.

The definitions provided under paragraphs (a), (b), (c), and (d) are acceptable as proposed. However, several additional definitions should be added to this section.

The term "charges" is introduced in Section 762.5 without definition. Clarification of its relationship to the terms "prices" and "costs" is requested.

The term "reserves" is introduced in Section 762.6 without definition. Clarification of its relationship to the terms "prices", "costs" and "charges" is requested.

The expression "unrecouped and unrecovered costs associated with provision of enrichment services to civilian customers" is found in Section 762.6 without appropriate definition. A complete definition for this expression is requested.

762.3 Enrichment of uranium of foreign origin.

The proposed requirement that a "domestic customer shall certify the country of origin of feed material delivered to DOE" is an unwarranted duplication of existing reporting requirements that customers already have to DOE through the EIA and therefore should be deleted.

The existing criteria specifically states that after 1983 "there shall be no restriction of the furnishing of feed material of foreign origin for the provision of enrichment services." The proposed criteria also should include a similar statement to the effect that "There shall be no restriction of the furnishing of feed material of foreign origin for the provision of enrichment services." Section III to the Supplementary Information section of the Federal Register notice of January 29, 1986, under the heading "Enrichment of Uranium of Foreign Origin", develops at great length the numerous significant negative implications of any import restrictions on foreign uranium, and the clear lack of any positive implications of such restrictions. The information presented in Section III is correct and is supportive of including the above suggested statement in the proposed criteria. There is clearly a need to retain such a statement, which in fact is present in the existing criteria.

762.4 Prices.

It clearly is in the collective best interests of the United States Government, the U.S. Treasury, the DOE and all of DOE's customers that DOE have the flexibility to price its enrichment services in a manner that permits it to respond to changing market conditions.

762.5 Costs.

This section states that "appropriate Government costs" will be "determined on a basis that includes the costs incurred in providing enrichment services to civilian customers". The term "includes" in the above statement should be replaced with the expression "includes only".

Paragraphs (a) through (e) in this section should clearly specify the above stated intent that only those portions of each cost component associated with providing enrichment services to civilian customers are to be included.

Particular attention is required with regard to imputed interest as described in Paragraph (e). The "imputed interest on investment in plant, working capital, the natural uranium contained in those inventories at the DOE enrichment plants

needed to provide enrichment services, and the separative work costs of pre-produced inventories" should be limited to that required to provide enrichment services to DOE's civilian customers. Costs incurred by DOE for reasons of national security or national policy should not be charged to the civilian customers. This also applies to the imputed interest that may be applied by DOE to any of the direct costs.

Thus, paragraph (e) should be changed to read: (e) Imputed interest on investment in plant needed for civilian production, working capital, the natural uranium contained in those inventories at the DOE enrichment plants needed to provide civilian enrichment services, and the separative work costs of reasonable operating inventories to serve civilian customers.

762.6 Recovery of prior unrecouped Government costs.

The "unrecouped and unrecovered costs associated with provision of enrichment services to civilian customers" have not been clearly described nor substantiated.

In the sentence "The estimate of such costs will include costs attributable to plant capacity used to provide enrichment services for civilian customers, but will not necessarily include costs attributable to plant capacity or other investments not properly allocated to the Government's costs associated with providing enrichment services to civilian customers" the word "necessarily" should be deleted to carry out the intent as described in Section III to the Supplementary Information Section of the Federal Register notice of January 29, 1986, under the heading "Recovery of prior Government costs." However, this entire section is unacceptable and should be deleted. See Enclosure 1.

762.7 Non-discrimination.

It is understood and thought appropriate that DOE will continue to offer enrichment services to its customers on a non-discriminatory basis. However, the concept of "similarly-situated customers" should be clarified.

762.8 Amendment of contract.

This provision, providing for amendment of the contract without additional consideration, is a standard part of most commercial contracts and clearly is desirable.

762.9 Termination by DOE.

Termination under paragraph (a) "upon reasonable notice at such time as commercial enrichment services are provided by another domestic source" should be available, with or without cost, to both DOE and the customer on the same basis.

Under paragraph (b) the expression "or becomes involved in bankruptcy proceedings" should be deleted. Involvement in bankruptcy proceedings does not in and of itself imply that the customer cannot meet its obligations under a contract.

762.10 Termination by customer.

As noted in comments to Section 762.9, termination by the customer should be available "upon reasonable notice at such time as commercial enrichment services are provided by another domestic source."

It is entirely appropriate that termination provisions, providing for termination by the customer, be included in any contract for enrichment services with DOE. It is also appropriate that "reasonable and appropriate charges for termination" be fairly negotiated.

762.11 Quantities of feed and product material.

This section provides DOE with the flexibility to operate its facilities in a manner that will enable it to best optimize its overall production costs. Proper use of such flexibilities is encouraged.

762.12 Customer's option to acquire tails materials.

Given DOE's ability to refeed tails material at its gaseous diffusion plants and the potential for AVLIS operation before the end of the century, the U-235 assay of the tails material that is delivered to the customer is important. Therefore the sentence "The U-235 assay of the tails material delivered to the customer will be within the sole discretion of DOE" should be deleted. The customer should be offered tails material at its transaction tails.

762.13 Responsibility for materials meeting specifications.

The customer should be protected through product specifications that address the isotopic composition of the product, particularly the Uranium-236 content. Appropriate terms and conditions for final acceptance of the product under such specifications should be provided within the contract.

762.14 Other terms.

This section provides both DOE and the customer with appropriate flexibility for negotiating an acceptable contract.

762.15 Prior contracts.

As discussed with respect to Section 762.6, customers who are now or who previously were a party to contracts with DOE or its predecessors, including the Utility Services Enrichment Contract

as well as earlier Requirements and Fixed Commitment contracts, did not enter into any of these contracts with the understanding that "In establishing prices for providing enrichment services for civilian customers; DOE would subsequently attempt to "establish reserves sufficient to return to the Treasury of the United States, over a reasonable period of time, previously unrecouped and unrecovered costs associated with provisions of enrichment services to civilian customers." In fact, it always has been represented that the prices being charged for enrichment services under each of these contracts were sufficient to recover "appropriate Government costs" as required by the criteria. Consequently, it appears that if the final version of the proposed criteria includes Section 762.6, there may be sufficient basis for a legal finding that none of DOE's contracts, present or past, are in fact valid. It is not clear at this time whether these potentially invalid contracts could be amended in a mutually satisfactory manner to conform to the proposed criteria.

ATTACHMENT B TO TESTIMONY OF EDISON ELECTRIC INSTITUTE
APRIL 9, 1986

THE EVALUATION OF NUCLEAR WASTE REPOSITORY PROGRAM COST SHARING BETWEEN CIVILIAN AND DEFENSE WASTES

The purpose of this document is to summarize an approach to the sharing of those parts of repository program costs which are common to civilian and defense wastes and to illustrate the application of this approach using preliminary but reasonable cost and waste data.

BACKGROUND

On April 30, 1985, a formal decision was made by President Reagan to dispose of defense high level waste in repositories that include civilian (spent fuel) wastes rather than in a separate NRC-licensed repository dedicated solely to defense waste disposal. One of the principal reasons favoring this decision is that defense and civilian wastes can be emplaced for disposal in combined repositories at considerable savings relative to emplacement in separate repositories[1]. An acceptable methodology for the equitable sharing of costs will have to be established. This methodology should become a part of DOE's established annual disposal fee evaluation process, and will have to be usable over an extended period. It is therefore important that it be based on sound principles of equity in cost sharing and the consistent application of appropriate methodology.

Costs which are unique to either Defense Waste or Civilian Waste, such as waste-specific transport or storage costs, would not be shared, but would be paid wholly by the Defense or Civilian programs, as appropriate. The remainder of this document provides:

1. A suggested set of basic principles for defining "equivalence" in cost sharing.

2. A suggested method for establishing the amounts and characteristics of actual and projected wastes for disposal.

3. An outline of the minimum capability of a costing methodology that will be consistently used to evaluate the long-term costs of separate and combined disposal programs.

4. A suggested cost sharing basis in which the above equity principles, projected waste loads and costing methdologies are applied to the determination of the fraction of costs to be borne by the defense and commercial sectors, and the timing of fee payments.

The document concludes with an illustrative estimate of cost sharing which is based on application of the basic equity principles to preliminary data on waste amounts, costs and the suggested cost-sharing and fee timing methodologies.

1. EQUIVALENCE IN COST SHARING

The NWPA, Section 302(b)[4], establishes the requirement that Defense Programs pay "for deposit in the Nuclear Waste Fund, amounts equivalent to the fees" paid by the utilities. DOE's regulations establishing terms and conditions under which waste disposal services are to be provided mandate that "fees to be paid by Federal agencies will be equivalent to the fees that would be paid under the contract" 10 CFR 961.5. "Equivalence" would include the following basic characteristics of the present utility fee structure.

1. The fees are based on actual past and evaluated future program costs and the proportional sharing of total program costs (as distinguished from just the cost increments due to Defense wastes) among all prospective repository users.

2. For wastes generated prior to April 1983, an appropriate one-time payment is due in June 1985. One-time payments made thereafter accrue interest from April 1983.

3. For wastes generated after April 1983, quarterly fees are due as the fission products are generated in reactors.

4. To the extent that the total of anticipated fees exceeds evaluated costs by some ratio, both Civilian and Defense fees should include that same margin ratio.

2. AMOUNTS AND CHARACTERISTICS OF WASTES

The physical numbers, size and thermal output of the basic waste disposal units that will be received by the repository and the corresponding times of origin of the fission products that ultimately become wastes going into the disposal units is a necessary part of any total cost evaluation, and must therefore be developed. However, it is believed that another basic principle should be established: that the numbers and characteristics of waste units will be based on the actual current amounts plus the best current estimate of projected operations of waste-producing facilities that are actually in current operation, or committed and in construction, and will not include the projected operation of projected power or production facilities. This will mean that estimates of utility spent fuel output will be based on the EIA "No new orders" case, rather than the current "Mid Case" of nuclear growth which includes the projected fuel output of projected reactors. It would also mean that the defense waste from projected new Defense production facilities will not be included. It would include current and projected wastes from the existing Savannah River, Hanford and Idaho facilities except those for which repository disposal is not indicated. The basis for this suggestion is that there is already a more-than-adequate lead time for planning the disposal of wastes when a new waste-generating facility is committed. Because there is already significant uncertainty dealing with the projected output of committed facilities, it is both unnecessary and possibly contentious to add the double uncertainty of the projected output from projected facilities. The very sound practice of periodic reviews of fee adequacy provides automatically for the future inclusion of new facilities at the time they are firmly committed. At that time, appropriate adjustment of fees and cost sharing would occur.

3. REPOSITORY PROGRAM COST MODEL

It is necessary to establish an acceptable reference waste disposal program and a related facility design and cost model that can realistically represent the timing and amounts of all relevant R&D costs, and facility capital, operating, and decommissioning costs. This program cost model should be sufficiently detailed that it can realistically represent total costs and cost differences in repository programs and facilities involving (i) only defense wastes, (ii) only commercial wastes, and (iii) both defense and commercial wastes. The reference waste disposal program and cost model should be similar to those currently in use by DOE in fee adequacy studies. It is essential that the same cost model be used for each system. This will assure that common design assumptions and common cost data are utilized. In this way the resulting cost differences reflect physical differences between systems, and are not due to differences in basic assumptions or data. Although the commercial and defense programs will each have non-repository program components, facilities and related costs which are solely specific to their respective wastes, the cost analyses done for cost sharing purposes should not include these. In general the cost-sharing analysis would include only the generic part of the current program development and evaluation (D&E) costs and the repository costs, and would exclude non-repository waste-specific costs such as spent fuel or defense waste transport. It would also exclude interim storage costs such as spent fuel storage R&D, MRS program costs or Defense R&D and DWPF storage costs, except where storage facilities are shared to reduce overall costs.

However, the commercial repository program requires two repositories whose operations are expected to be coordinated. The addition of defense wastes, even if limited to one of the two repositories, will affect both repositories. Furthermore, the annual fee evaluations must be based on two repositories. It is therefore desirable that cost sharing be based on a cost analysis that includes both repositories. It is also important that the evaluations recognize the probable continuation of disposal operations past the year 2020, based on wastes that originate through the year 2020, and

include these in the overall cost evaluations. The year 2020 is picked to be consistent with the established disposal fee evaluation process.

4. THE BASIS FOR COST SHARING AND FEE DETERMINATION

The projected waste loads, and the repository program cost model are used to provide consistently-developed costs for repository programs involving:

1) Only defense wastes (a single repository)

2) Only civilian wastes (two repositories)

3) Combined defense and civilian wastes (two repositories)

It is expected that the unit costs of disposal will be the lowest in the combined-repository situation. The basic question, which is also the principal concern of this document, is "How are the total costs of the combined defense-commercial repository program to be shared between the defense and civilian sectors?"

There are a number of physical characteristics of the wastes which have an influence on waste disposal costs, and which could be proposed as a basis for cost sharing. Such possible cost sharing options include:

1) Costs shared in proportion to radioactivity (curies) at generation or at emplacement.

2) Costs shared in proportion to thermal output at generation or at emplacement.

3) Costs shared in proportion to volume of wastes or volume of excavation.

4) Costs shared on the basis of numbers of disposal packages.

Actual disposal costs depend moderately on thermal output at emplacement and on the numbers of disposal packages, and depend somewhat on the volume of wastes and on the radioactivity. However, significant portions of repository costs, such as the Development and Evaluation costs are essentially independent of waste characteristics. For single waste types

such as spent fuel, which have the same basic form, and which cool for similar periods, energy production is a simple and reasonable basis for allocating costs among generators of that single waste type, and that is the basis for the 1 mill/kwh disposal charge for spent fuel. However, when wastes such as defense and civilian wastes differ markedly as to waste form and cooling period, no single physical measure can be expected to represent cost dependence with sufficient accuracy for cost sharing. Therefore, the most reasonable measure for cost sharing appears to be the costs, themselves. Furthermore, the basic methodology for cost-based cost sharing between defense and civilian wastes is already in place by virtue of the established methodologies and data for the periodic evaluation of civilian waste fee adequacy. Specifically, the evaluated costs of separate and combined repository programs can provide an equitable basis for cost sharing, as follows:

> Each sector (defense and civilian) is to pay a fraction of the combined-repository-program costs which is the same as that sector's fraction of the sum of the evaluated costs for separated repository programs.

The above cost sharing basis has the inherent characteristic that the cost savings resulting from combined operations are shared in proportion to cost obligations. This characteristic appears to be a central requirement for the equitable treatment of both sectors. In addition, this cost sharing basis has the advantages of being relatively simple in concept and of avoiding the potentially-contentious need to attempt assigning costs to each sector in a combined repository program. The costs themselves are used to make the basic cost sharing assignment. This will focus the attention of the cost evaluators on the fundamental issues of comparable and consistent system representation and design, cost methodology, cost data bases, and financial assumptions, including the effective discount rate.

Once the total combined-system costs and the portions to be borne by each sector have been determined, the amount and timing of fees can also be determined. This is done by allocating the costs within each sector on a per-

unit basis which is related to when the fission products are generated. The commercial sector is already using energy generation as the fee basis (1 mill/kwhe). Because of security reasons, allocation on the basis of direct energy output may not be acceptablefor defense wastes , but some reasonable basis could be used such as "per equivalent waste package" if this were closely related to when the "equivalent waste packages" (i.e., fission products) were generated.

Since the commercial-sector fees are already established, the defense-sector fees are to be determined on a comparable basis. Using the pre-April/83 number of waste units and the subsequent annual units, the amount of the defense waste one-time and annual cost obligations can be determined. The defense cost obligations are then translated into fee obligations by adding the same percentage margin that the current 1 mill/kwhe commercial waste fee represents over the newly-evaluated unit costs for the commercial sector.

5. ILLUSTRATIVE EXAMPLE OF DEFENSE WASTE COST SHARING

The approach described above is demonstrated in this section. The purpose of this example is two-fold: to illustrate the suggested method with reasonable numbers; and to indicate the general nature of the results.

With respect to waste amounts, defense waste deliveries are as stated in the Defense Waste Management Plan, DOE/DP-0015[2], totalling 19,200 packages through the year 2020, plus an additional 5 years assumed to be at 650 packages/year so as to include disposal of all waste from the reprocessing of defense production fuels discharged through 2020 assuming 5-year cooling, consistent with the same assumption for civilian spent fuel.
The commercial wastes (spent fuel) are based on the EIA's no-new-order case with increasing burnup[3], totalling 80,700 MTU discharged through 2020. At an average disposal package loading of 6 PWR/18 BWR assemblies the number of commercial packages is estimated to be about 27,600. The assumed repository disposal rates for these packages are summarized in Table 1. The assumed operating periods of the commercial and combined-repositories are shorter, and the disposal rate capacity of the second repository is less than for DOE

TABLE 1

ASSUMED REPOSITORY DISPOSAL RATES

	Operating Period			
	1998-2007 (10)	2008-20 (13)	2021-25 (5)	Totals
A. Separated				
Defense, Pkgs/yr	620	1,000	650	22,450 pkg.*
Civilian 1				
MTU/yr	3,000	1,500	-	49,500 MTU
Pkgs/yr	1,027	515	-	16,965 pkg
Civilian 2				
MTU/yr	-	1,825	1,500	31,200 MTU
Pkgs/yr	-	625	515	10,700 pkg
B. Combined				
Repo 1, MTU/yr	3,000	1,500	-	49,500 MTU
Civilian Pkgs/yr	1,027	515	-	16,965 pkg
Defense Pkgs/yr	620	1,000	-	19,200 pkg
Total Pkgs/yr	1,647	1,515	-	36,165 pkg
Repo 2, MTU/yr	-	1,825	1,500	31,200 MTU
Civilian Pkgs/yr	-	625	515	10,700 pkg
Defense Pkgs/yr	-	-	650	3,250 pkg
Total Pkgs/yr	-	625	1,165	13,950 pkg

* This total is the 19,200 packages available for disposal, plus 650 pkgs/yr for 5 years, based on defense production fuel discharges and 5-year minimum cooling, consistent with civilian fuel discharges through 2020.

evaluations, such as the Mission Plan[4] or the Fee Adequacy Assessment[5], because the amounts of spent fuel are less, consistent with the assumption that only the wastes from committed waste generation facilities are to be included. With a separate defense repository, a 28-year operating period is required. The first commercial repository is assumed to operate 10 years alone, plus 13 years overlapping with the second repository. The second commercial repository is assumed to operate alone for 5 years after 2020. In the combined repositories, the defense wastes go solely to the first repository during its operating period, and thereafter to the second repository.

It should be noted that the above evaluation includes two civilian repositories, instead of the single civilian repository assumed in the cost studies performed by Defense Programs[1]. The fundamental reason for using two civilian repositories in the cost sharing analysis is that it appears undesirable to restrict defense wastes to a single repository in the absence of analyses which define the best operating mode for a two-repository system. For example, transportation impacts and costs are clearly reduced if DWPF wastes were to be shipped to the second repository presumably located in the eastern U.S. once that repository were opened. Basic system operating strategy probably requires that both repositories be capable of disposing of both defense and civilian wastes, as backup in the event of difficulties at either repository, and in anticipation of filling and closing the first repository. The fee evaluation process is already established as a two-repository evaluation and this should continue when defense wastes are added to the system. For these reasons, it is suggested that a two-repository system, including defense wastes, be the basis for the cost-sharing evaluation.

The waste package characteristics which have the strongest impact on costs are summarized in Table 2. The defense waste package has a slightly larger diameter than the commercial package and therefore costs somewhat more. However, the defense waste package has only 1/6 of the thermal output of the commercial package and is only 77% of its length. Because of this, it requires only 1/6 of the underground area and 1/8 of the placement corridor mining compared to the commercial wastes. Further, because of this reduction,

the defense repository may be operable with fewer deep shafts (4 per repository vs. 5 for the commercial repository). These principal differences are reflected in the costs.

TABLE 2

ASSUMED WASTE PACKAGE CHARACTERISTICS

	Defense Package	Commercial Package
Contents:	DHLW	6 PWR/18 Bwr (2.92 MTU/pkg)
Thermal Output, Watts	500	3,000
Waste Overpack ID	61 cm	45 cm (consolidated)
Waste Canister Height	10 ft.	13 ft.
Waste Overpack Cost (1983)	$40,800	$26,100
Total No. of Packages	22,450	29,550

The cost methodology used for this preliminary assessment is based on the methodology used in the WADCOM (WAste Disposal COst Model) computer program[6]. It represents the principal dependences of repository capital and operating costs on repository capacity, and on waste package characteristics, principally package size and thermal output. The overall costs are normalized to the bedded salt costs in 1983 dollars from Table 10-6 of DOE's Draft Mission Plan[4] and increased by 19% to be consistent in aggregate with the first salt repository (1984) costs in Table 1 of the Fee Adequacy Assessment[5]. The latter costs are generally consistent with the aggregate costs in Table 10-9 of the Final Mission Plan[4]. The resulting cost model is believed to provide a reasonable representation of repository costs and cost differences that are related to variations in repository capacity and waste package characteristics. The results will be internally consistent in the sense that basic assumptions and cost data are common to all cases, and the cost differences that are generated will be due to identifiable physical differences between systems.

The cost analyses were performed on three systems:

1) A defense-only repository

2) Two commercial-only repositories

3) Two combined defense-commercial repositories

The repositories which include commercial waste perform the fuel consolidation function in repository surface facilities. The defense-only repository does not need this function and saves the associated capital and operating costs. In the combined repositories, cask handling and waste package handling and disposal facilities are larger to accommodate the added requirement due to defense wastes. The same amounts of waste disposal are assumed to occur each year in both the separate and combined systems. In addition, development and evaluation (D&E) costs for the first and second repositories are included, and are taken from Table 1 of the Fee Adequacy Analysis[5]. The total of $7.5 billion is assumed to be divided into $4.0 billion for the first, and $3.5 billion for the second civilian repositories.

With respect to the D&E costs, there is some debate as to the extent to which a Defense waste-repository has to undertake the full and complete NWPA-specified process of site nomination, recommendation and final selection, and the related extensive public participation process. However, a Defense repository must be licensed by the NRC and this involves the extensive characterization of three sites, plus the public participation that is inherent in the NRC licensing process. It is virtually impossible to predict the net Defense D&E cost savings that would arise from the procedural differences between the Defense and Commercial siting and licensing process. However, because of the nature of the NRC licensing process, including its established and well utilized provisions for public participation, the Defense and Commercial D&E costs for the Defense and first Civilian repositories are judged to be essentially identical at $4.0 billion.

The cost results are summarized as follows:

	Total Costs, $-million (1984)					
	Waste Pkg	Disposal	Subtotal	D&E	Total	%
Defense-only	1,410	2,940	4,350	4,000	8,350	32
Commercial 1	1,600	4,100	5,700	7,500	17,700	68
Commercial 2	1,150	3,350	4,500			
Totals			14,550		26,050	100
Combined 1	2,640	4,950	7,590	7,500	20,000	
Combined 2	1,350	3,560	4,910			
Totals			12,500		20,000	
% Saving over Separate Repositories:			14%		23%	

The basic conclusions of the above are 1) that both the Defense and Civilian programs will save over 20% of common costs by combining repository operations, and 2) that the defense repository costs would be approximately one-third of the shared portion of the combined repositories program costs.

It is worthwhile to understand the basic reasons for the general level of defense waste disposal costs relative to commercial costs. In this regard, it has been noted (1) that defense wastes have only 15% of current total radioactivity and this level will be down to 3% by the year 2000. Considered in isolation, these facts can create the impression that defense waste disposal costs should be small, relative to commercial costs. On the other hand, the waste forms are significantly different and this is quantified by the more than 22,000 large defense waste packages as compared to the less than 28,000 smaller commercial waste packages anticipated to originate through 2020. By this particular measure, defense wastes are 45% of total wastes. The key point is that it is costs that are being shared and particular physical characteristics are important to cost sharing only to the extent that they influence costs. The basic reasons that the single Defense repository program has evaluated costs that are about one-third of total separate-repository program costs are 1) the Development and Evaluation (D&E) cost is about $4 billion per repository and is essentially independent of waste characteristics, 2) the large number of defense waste packages which offset the real cost savings from the lower thermal output of defense wastes,

and 3) the significant level of fixed repository capital and operating costs such as surface facilities, shafts, underground development and ventilation, that are largely independent of waste characteristics and amounts. In summary, the principal source of the savings from a combined Defense-Civilian, 2-repository program as compared to a separated 3-repository program is the avoidance of D&E costs for 1 repository, amounting to about $4 billion, plus the avoidance of fixed facility costs, amounting to an additional $2 billion.

Once the costs of the combined repository program are evaluated, and the defense portion allocated, the amount and timing of defense waste fees can be determined. First, the margin ratio of current Commercial fees over current Commercial costs must be evaluated. This margin ratio of fees-to-evaluated-costs applies to both repository and non-repository costs in the Commercial program but it applies equally to all costs. It is therefore appropriate and equitable to apply this same ratio to evaluated Defense costs in order to determine Defense waste fees. Continuing to use the above example for illustration, the Commercial portion of the combined repository program costs is 68% of $20 billion, or $13.6 billion. To this must be added other program costs which are specific to Commercial wastes, such as spent fuel transport, and spent fuel storage R&D. If these added costs were $5.2 billion, the total evaluated cost would be $18.8 billion. The fee margin is determined by ratioing expected commercial fee revenue at 1 mill/kwh to this total evaluated cost. The EIA No-New-Orders Reference case, on which the spent fuel output estimates are based, shows a revenue of about $22.5 billion. This is then ratioed over the total evaluated commercial program cost to determine the overall fee margin, 1.2 in this example. This same margin would be applied to the defense waste costs, as follows: Evaluated defense costs are 32% of $20 billion or $6.4 billion. Applying the 1.2 fee margin to this yields $7.7 billion as the defense fee base. If this is allocated on a per-package basis, the average per-package cost is about $345,000 over 22,450 waste packages. Assuming, hypothetically, that the pre-1983 waste inventory of Savannah River, Hanford and Idaho wastes is the equivalent of 5000 packages, and the wastes which will make up the remaining 17,450 packages are being produced over the remaining 38 years through 2020 at an average rate of 460 packages/yr, an immediate one-time payment of $1.7 billion and an annual

average payment of $158 million would be indicated for defense wastes. It should be noted that although the fee margin ratio is sensitive to the particular waste management and cost scenario chosen for the evaluation, when it is used with an already-fixed Commercial unit fee to develop the Defense fee, the latter is not particularly sensitive to the cost evaluation scenario. In fact, to the extent that defense and commercial costs and waste amounts maintain relative relationships across various scenarios, the per-unit defense waste fee is insensitive to the evaluation scenario. It is therefore desirable to select one or more reasonable scenarios for evaluation of an equitable defense fee, but it is not anticipated that the defense fee will be significantly influenced thereby. The two most sensitive factors to the results of the evaluation appear to be 1) the relative amounts and characteristics of the two wastes, and 2) the costs of those parts of the repository where waste amounts and characteristics have the largest influence on costs.

CONCLUSIONS AND RECOMMENDATIONS

The principal conclusions and recommendations of this document are:

1. Equivalence in the sharing of costs of nuclear waste disposal between the Defense and Civilian sectors should require that both sectors pay fees based on the same principles that have already been established and implemented for the Civilian sector.

2. The evaluated costs of separated and combined repository programs provide a sound basis for determining and sharing the cost savings that will result from combined repositories. It is recommended that the fraction of combined-program costs borne by each sector be proportioned to the evaluated costs of separate repository programs. This results in sharing the cost savings in proportion to cost obligations.

3. An illustrative example of Defense waste cost sharing has been provided herein, based on waste and cost data that are believed to be reasonable. This preliminary analysis indicates that the appropriate level of Defense waste cost sharing is in the range of one-third of combined-repository program costs. It is the principal recommendation of this document that the level of Defense waste cost sharing be established with greater rigor and precision than was appropriate for this preliminary scoping document.

REFERENCES

(1) U.S. Department of Energy, "An Evaluation of Commercial Repository Capacity for the Disposal of Defense High Level Waste", (Draft), DOE/DP-0020, July 1984; (Final) DOE/DP-0020/1, June 1985

(2) U.S. Department of Energy, "The Defense Waste Management Plan", DOE/DP-0015, June 1983

(3) U.S. Department of Energy, Energy Information Administration, "Projections of U.S. Nuclear Power Plant Capacity, Generation, and Spent Fuel Discharges, 1984-2020", SR-NAFD-84-01, March 1984

(4) U.S. Department of Energy, "Mission Plan for the Civilian Radioactive Waste Management Program", (Draft), DOE/RW-0005, April 1984; (Final) June 1985

(5) U.S. Department of Energy, "Nuclear Waste Fund Fee Adequacy: An Assessment", DOE/RW-0020, February 1985

(6) Battelle Memorial Institute, "WADCOM: A Waste Disposal Cost Model", ONI-6, June 1983.

ATTACHMENT C TO TESTIMONY OF EDISON ELECTRIC INSTITUTE
APRIL 9, 1986

Edison Electric Institute
Board of Directors
Meeting on March 13, 1986

Resolution on
Integral Monitored Retrievable Storage Facility (I-MRS)

The Edison Electric Institute (EEI) supports the Department of Energy's general course of action for the implementation of the Nuclear Waste Policy Act of 1982 (NWPA). The final disposal of nuclear waste is to be in deep underground geologic repositories as mandated by the NWPA. The DOE Proposal for the construction of an Integral Monitored Retrievable Storage Facility (I-MRS) is a positive and appropriate step for the overall nuclear waste disposal program. We urge Congress to direct the DOE to proceed with the I-MRS and to require DOE to implement the Improved-Performance Plan described in the June 1985 Mission Plan for the Civilian Radioactive Waste Management Program. There are six significant advantages of an I-MRS stated in the DOE Proposal: (1) improvement in system development, (2) earlier waste acceptance, (3) greater reliability and flexibility, (4) simplified repository surface facility, (5) improved transportation system and, (6) institutional interaction benefits. Including an I-MRS as one element of the disposal system will enhance the overall DOE Nuclear Waste Disposal program.

Council of Energy Resource Tribes

1580 Logan Street · Suite 400
Denver, Colorado 80203-1941
(303) 832-6600

April 18, 1986

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Ute Mountain Ute
Edward T. Begay
Vice Chairman
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Laguna Pueblo
Muckleshoot
Northern Cheyenne
Pawnee
Ponca
Rosebud Sioux
Santa Ana Pueblo
Saginaw Chippewa
Seminole of Florida
Shoshone - Bannock
Southern Ute
Spokane
Tule River
Umatilla
Ute
Walker River
Zia Pueblo

Executive Director:
A. David Lester

Mr. Tom Bevill
Chairman
Appropriations Subcommittee
on Energy and Water Development
U.S. House of Representatives
Washington, D.C. 20515

Dear Chairman:

Enclosed are 15 copies of our testimony submitted for the record on behalf of the Council of Energy Resource Tribes regarding the FY 1987 Budget of the Department of Energy.

I appreciate your scheduling me to appear before the Subcommittee to present this testimony on April 9th and I regret not being able to appear as scheduled due to an airline flight over-booking problem and the lack of other available flights out of Denver.

We would appreciate your making our testimony a part of the hearing record and your consideration of the views expressed therein.

Should the members or staff of the Subcommittee have any questions or need any additional information we will be pleased to respond to your request.

Yours cordially,

A David Lester

A. David Lester
Executive Director

Enc.

1975 - 1985
Celebrating a Decade of Achievement

STATEMENT OF THE COUNCIL OF ENERGY RESOURCE TRIBES

BEFORE THE

ENERGY AND WATER SUBCOMMITTEE

OF THE

HOUSE APPROPRIATIONS COMMITTEE

REGARDING FY '87 BUDGET AND PROGRAMS

FOR THE

DEPARTMENT OF ENERGY

TESTIMONY FOR THE ENERGY AND WATER SUBCOMMITTEE OF THE HOUSE APPROPRIATIONS COMMITTEE

Mr. Chairman, distinguished Committee members, my name is A. David Lester, Executive Director of the Council of Energy Resource Tribes (CERT). CERT thanks you for this opportunity to address your Committee regarding the FY 1987 budget and programs of the Department of Energy.

The Council of Energy Resource Tribes is a multitribal organization of 42 tribes who collectively represent nearly half of all American Indians living on or near reservations and account for some 51,000 square miles of tribal lands; about 60% of all reservation lands in the country. These lands contain 700 million barrels and 5,000 billion cubic feet of proven oil and gas reserves, respectively, which represents approximately 7% of total national on-shore reserves. The tribes also own 30 billion tons of recoverable coal which is about one-third of the recoverable coal in the west; and tribal lands contain half of the nation's privately owned uranium reserves. Additionally, they possess significant hydroelectric and geothermal potential along with substantial quantities of shale oil and tar sands deposits.

The CERT tribes are committed to a program of balanced, environmentally responsible, tribally managed resource development. Energy resource development must contribute to long-term tribal economic and social development to have lasting benefit to the tribes and their members.

CERT has marked a decade of progress in which it has served as a catalyst for dramatic changes in the federal-tribal relationship, particularly those relationships that relate to mineral resource development and management.

As most of you know, the concept of CERT crystallized in 1975 when 25 Indian energy resource owning tribes signed an organizing charter. The following year, CERT was incorporated in Washington, D.C., and began working with the federal Department of Energy (DOE) (then known as the Federal Energy Administration) to include Indian tribal issues in the formulation of a balanced national energy supply. Later, under an interagency agreement which included the Department of the Interior, Department of Commerce, and Health and Human Services, the DOE began to play the added role of administrator of most federal funds directed toward assisting tribes develop their resources according to their own plans and timetables.

In the ten years since the Council of Energy Resource Tribes was formed, the energy production from reservation lands has more than doubled to the present annual equivalent of 132,000,000 barrels of oil. This production sustains more than 10,000 direct full-time jobs in the private sector. Additionally, some 2.5M residents in southern California alone depend on coal and natural gas production from Indian lands for their electricity needs.

This dramatic increase in production has been accomplished in spite of the downward trend in the oil and gas prices of the last few years and in the face of the nearly total loss of our domestic uranium industry which caused the closure of the world's largest open-pit uranium mine on one of the CERT reservations.

Despite the virtually unprecedented collapse of oil and gas prices of recent weeks, we see little likelihood that the level of production from CERT lands will decline. In fact, the CERT staff is preparing an application for one of our member tribes for a license to construct a hydroelectric generating plant which we believe can be financed for some $100,000,000 in the private sector. Many of our member tribes are now beginning to undertake an aggressive marketing campaign to sell their products directly to end users,

thus securing stable markets for their production and increasing their own revenue streams. Many recent agreements for exploration and development on our lands have included terms requiring minimum expenditures for exploration and development over a period of years, and we are confident that those agreements will be honored. Good quality steam coal, by far our most abundant resource, continues to represent significant potential even in the present soft market.

It is for this reason that we believe the interagency contract administered by the Department of Energy has generated a return on its investment unparalleled by any other similar agreement. Much of that which has been achieved by the energy resource tribes has been because of the considerable economics of scale obtained by the maintenance of a small professional staff which is available to all member tribes. This situation has been made possible by the cooperation of the Department of Energy in administering the interagency contract.

Any reduction of this support would critically impair the progress of our member tribes in obtaining self-sufficiency because it must be remembered that resource ownership does not necessarily equate with financial wealth. Tribal resource development has been slower than that on non-Indian lands in the United States. And the financial resources needed for services to tribal members and capital for tribal development far exceed revenues from energy production. Per capita personal income for CERT member tribes is less than half of the U.S. national average of $11,000 for all citizens, and unemployment among CERT member tribes is 33% compared to 31% for all Indian tribes and four times greater than for all Americans.

We cannot agree with the Administration's decision to reduce the Fiscal Year 1987 appropriation earmarked for the Council of Energy Resource Tribes by $150,000. This

reduction will interrupt Indian progress toward obtaining economic freedom and interrupt the critically important negotiations and marketing efforts which are, in fact, underway at this time.

The irony is that the tribes have been working dilligently toward freeing themselves from federal support systems in cooperation with DOE and several other federal agencies. The energy resource tribes have always expected to replace the financial assistance provided by these agencies with economic systems generated by the careful development of their own resources.

However, just as a farmer cannot harvest before the crop is ready, the interest on the federal investment in Indian energy must be allowed to reach maturity in order to avoid financial penalties. Reducing the amount of the President's 1987 budget allotted to the Council of Energy Resource tribes is like calling in the chits before the game is over. It defeats the purpose of the game.

It also continues the old pattern of paternalism because Indian people without jobs and self-sustaining economies are subject to the continuation of the federal transfer payments, a fact of life that is neither pleasing to the taxpayers, to the jobless individuals, or to the impoverished tribal governments that try to serve their equally poor members. We strongly recommend that the appropriation for CERT be at least sustained at the FY 1986 level of $350,000 in order to provide the continuity needed for our tribes to arrive in the marketplace with the financial and economic independence which we are seeking, and which the President himself has urged. Our energy resource tribes are not unaware of or insensitive to the Administration's and the Congress' attempts to limit spending and reduce the nation's debt. As members of the national community, we also share concern over the country's financial shape and are willing partners in the efforts to

control deficit spending. However, in the overall crunching of figures employed to satisfy the budget reduction effort, we feel it is counterproductive to reduce disproportionately monies earmarked for Indian projects, monies which actually generate revenue at the local level. The alternative is to be penny-wise and pound foolish and perpetuate the nearly total dependence of Indian reservations on welfare and other federal support systems.

Last year the appropriation earmarked for technical assistance to energy resource tribes was $350,000 with which, while meager in relation to prior year funding levels (up to $1M in FY '82), we still were able to move over 100 projects toward completion, generating returns far exceeding the government's investment.

We are entering a new phase of co-venturing with the private sector which will bring us closer to building our tribal economies which are currently underwritten by the federal sector into economies which are financed by our member tribes through not only energy production but with economic diversification as well. All of us recognize that energy resources constitute the principal source of potential wealth; the principal source of revenue to provide governmental services to our people and to reduce our dependence on federal support; our principal source of jobs and our major opportunity to develop, diversify and stabilize our reservation economies.

COUNCIL OF ENERGY RESOURCE TRIBES

NINE PRODUCTION-ORIENTED CERT PROJECTS 1985-1986

Cherokee Hydroelectric Phase II

The Cherokee Nation of Oklahoma under this grant assistance is continuing efforts in the development process of their Hydroelectric Power Plant at Mayo Lock and Dam 14. The project, originally approved in FY 84, has advanced beyond Phase I parameters, and continues to have significant momentum. Successful completion of the project has the potential of providing the tribe with royalty payments of $300,000 per year (1985 dollars) for 25 years and for the next 25 years payment up to $300,000 per year.

Rocky Boy Coal Mine Evaluation

The ultimate goal of the coal evaluation is to bring the existing coal resources of the Rocky Boys Reservation up to production status. To accomplish this goal DOE Funds are being used to support the three project phases required. Phase I is a Data Base Review and Preliminary Market Assessment. Phase II is Reserves Verification and Preliminary Mine Planning, and Phase III entails Detailed Mine Permitting and Project Financing. With successful completion of Phase I showing good area distribution of coal of good quality and local markets available to purchase coal, Phase II is now in process. Favorable results will lead to coal mine development and production, thus diversifying the economic base of the reservation.

Cheyenne-Arapaho Oil and Gas Accounting System

The Cheyenne-Arapaho Tribes of Oklahoma request technical assistance from CERT in instituting a tribal oil and gas accounting system for the oil and gas energy activities on their lands. Such a system is to include: (1) accounting of tribal working interest, (2) accounting of tribal royalty interest, and (3) be an integral part of the tribal financial management system. Although this is a tribal specific project, it has much broader implications for portability in addressing a paramount concern of accountability common among all oil and gas energy producing tribes.

Fort Belknap Oil and Gas Prospectus

As a direct result of CERT's oil and gas promotional activity during project 060-1034, five oil and gas companies have expressed preliminary interest in potentially negotiating an agreement for a large combination of tribal and allotted acreage. These companies include: Phillips, Fuelco, Wintershall, Quintana, and Coastal.

The Assinibioine and Gros Ventre Tribes at Fort Belknap have requested technical assistance from CERT to conduct a presentation with these interested companies at an informational meeting in Denver on August 14, 1985. This meeting resulted in formal submittals and follow-on negotiations with the tribes to which continued technical assistance shall be required. If successful the net short-term benefit to the tribes could be several hundreds of thousands of dollars in bonus consideration as early as late fall.

Paragon Ranch, Phase II

Paragon Ranch is composed of (1) a coal mine in the Paragon Ranch area on the Navajo Reservation; (2) four 500 MW power plant units, known as NMGS; (3) a transmission system composed of two 500 KV-AC lines on the Navajo Reservation. Funds are being used to support this phase of the project in the evaluation of the Navajo contribution to the net benefits derived from the transmission system. It is also intended to value coal and water as assets for the New Mexico Generating Station which will be consuming Navajo coal and water. The tribe wants to utilize its coal, water, and transmission rights-of-way for two 500 KV-AC transmission lines to optimize four units of 500 MW power plants. It is expected that the mining of coal and operation of the power plant will create employment and income for the Navajo Nation.

Spokane Dawn Mine Valuation

Funding assistance to this project is to determine the value of Dawn Mining Company operations of the Spokane Indian lands. This determination would be conducted in close coordination between the Tribal leadership and its legal counsel because of the complex legal and jurisdictional issues involved. The project is expected to include ore reserve calculations, stockpile calculations, ore analysis of past ore sales, other appropriate financial information, estimates of production, and projections of future sales and profitability.

This project should result in determining a fair value of the property for tax purposes. The determination will assist the Spokane Tribe in evaluating their tax code and establishing administrative functions of their tribal government and addresses effects of tribal energy resource development.

Chemehuevi Solar Electric Power Generating Station - Phase II

The recent feasibility study of solar electric power generating capability on the Chemehuevi Reservation has demonstrated a potential opportunity for future commercial development of solar electric power generation on the reservation for both tribal use and sale to a utility. Funding support of this project consists of preparation of an RFP to be issued to the most promising system developers/manufacturers as determined in the feasibility study, followed by a review and evaluation of the project proposals leading to a selection of the prime candidate. Negotiations will also be initiated with the utility (Southern California Edison Company), and Western Area Power Administration (WAPA)

related to the purchase and distribution of electric power derived from the proposed 5-30 Mwe solar electric power generating station. Possible sources of project financing also will be investigated and structured during the Phase II effort.

Crow/Shell Negotiations

Crow Tribal Council requested technical assistance from the Council of Energy Resource Tribes in its renegotiation with Shell Oil Company in regard to a Coal Mining Agreement dated May 8, 1980 and effective in 1983. Shell had requested amendments to that Agreement which included an extension of the primary lease term to twenty years, annual rental payments of $192,000 in lieu of an annual $3,000,000 minimum royalty payments that were scheduled to being in 1986 and a provision for the Crow Tribe to waive tribal severance taxes on coal produced from the lease.

On December 30, 1985, because of the terms of the Agreement, Shell gave notice that is surrendered its rights to the Agreement. However, Shell also stated that it remained ready to continue discussions concerning the coal reserves. The Crow Tribe is considering comencing negotiations with Shell on a new agreement.

WEDNESDAY, APRIL 9, 1986.

DOE PROGRAMS

WITNESS

ROGER G. LITTLE, PRESIDENT, SPIRE CORPORATION

Mr. MYERS. Next is Roger Little, President of Spire Corporation.

Mr. LITTLE. I am the Chairman of the Photovoltaics Division and President of the Spire Corporation, so my statement here today is in support of an increased photovoltaics, but compared to what DOE has recommended.

It converts sunlight to electricity, but it is an electronics-based industry with tremendous export potential.

Three-quarters of the world's population does not have electricity. We can get to that market if we do the right things now with our research.

The industry is much too small now to support the research that needs to be done to reduce the costs of the product to get to these markets. The industry is about $250 million right now, and to get to the markets, it is projected to grow to something like $2 billion by 1990, and $10 billion by the year 2000.

We are running into some heavy competition with the Japanese who have targeted photovoltaics as an industry for them to pursue in the future.

Their research and development budget in 1987 will for the first time surpass the DOE's budget. In 1985 it appears we are neck in neck with the Japanese in the market share in the world.

They are taking our technology to market, all the investments we have made, DOE and the industry.

We need DOE's help. The industry has stepped forward and done a lot of cost sharing on the R&D that has been conducted, but we need to continue to get the DOE's help.

The OMB $20 million tight budget would undermine and result in an industry which no longer can survive. We need to be at that $50 million which has been flat for the last few years.

If we don't get it, we will lose our momentum and our market share. When we get the technology in place and contribute to the grid, we want to be there, and we don't want the Japanese to beat us to that market in our own country.

Thank you very much.

Mr. MYERS. Thank you very much.

I believe this is your first appearance. We hope we can do something. Three-fourths of the world's population is without electricity.

Mr. LITTLE. That is correct. India, 5,000 villages, 500 people or more, no electricity, no way to get it.

Mr. MYERS. This would be an effective and efficient source.

Thank you for your testimony.

[The statement of Roger G. Little follows:]

TESTIMONY

by

Roger G. Little

President

SPIRE CORPORATION

Bedford, MA 01730

before the

Subcommittee on Energy and Water Development
House Appropriations Committee

APRIL 9, 1986

WASHINGTON, DC.

59-750 O—86——20

1.0 INTRODUCTION

The technology for the direct conversion of sunlight to electricity, photovoltaics, continues to hold great promise for the future of America. Even as this promise becomes more clear, the American photovoltaic community is faced with the potential of significant Department of Energy research budget reductions. The resulting impact could cause our nation to lose momentum and the preeminent worldwide position we have obtained with photovoltaics technology.

The purpose of this letter is to state briefly and concisely:

(1) the opportunities before us;

(2) the progress that the photovoltaic industry has made in partnership with the Department of Energy;

(3) the likely effects on the photovoltaic community of additional significant research budget cuts at this time; and

(4) the need for the United States and its Department of Energy to continue their commitment to the advancement of the technology as we move toward large scale commercialization.

2.0 PHOTOVOLTAICS IS MUCH MORE THAN AN ENERGY OPTION

It is a renewable energy source that is unequaled in terms of benign environmental impact and broad application.

2.1 Photovoltaics is Ideal for Utility Growth

Although oil prices have dropped over the past two years, electricity prices have not. Many U.S. utilities are at a critical crossroad as they confront an uncertain future for electricity demand. Large conventional capacity additions required for their scale economies pose considerable financial risks to the industry. Photovoltaic technology, however, has proven itself to be ideal for adding dispatchable generating capacity in the required incremental quantity. The fact that photovoltaic energy production has minimum environmental impact is an important attribute for utilities, their regulatory commissions, and concerned citizens.

2.2 Photovoltaics Can Improve the Balance of Payments

Photovoltaics is a high technology export industry. The demand for electricity in developing countries, which lack established utility distribution grids, gives photovoltaics the potential of becoming a large-scale export commodity. However, should our government and industry not meet the challenge, photovoltaics as a successful and mature technology could become a major import product. Although America now holds a leadership position in the technology, the Japanese are aggressively pursuing commercialization of America's research base. As research budgets have been reduced, many American companies have sold the only product they have market-ready, the know-how itself, for survival. We cannot allow our investment in this technology to be dissipated.

2.3 Photovoltaics Can Reduce U.S. Reliance on Foreign Energy Sources

Photovoltaics can reduce our nation's dependence on foreign oil imports. Photovoltaic production requires no off-shore components, and once installed, photovoltaic arrays require no fuel and little maintanence, thus making such power sources immune to fluctuating oil prices. The present relative calm is the ideal time to carry forward research on this technology, as Japan and other nations are now doing.

2.4 Photovoltaics Can Contribute to the World Standard of Living

Photovoltaically powered water pumps, medical refrigeration, electric lights and television receivers have been widely deployed. These stand alone systems have been used to educate, improve the health, raise the standard of living, and improve the quality of life for people throughout the world including the United States. Several foreign nations - notably Japan, Germany and France - have listened to the requests of developing countries for access to this appropriate technology and routinely supply photovoltaic equipment as part of foreign aid programs.

2.5 Photovoltaics Can Make Our Military Stronger

Energy self-sufficiency is a must for our military. Portable photovoltaic power systems are being used for communications and field installation in place of diesel oil generators. The Department of Defense is actively working on more applications - not because of legislative mandate but because photovoltaics fills a real need for quiet, reliable, maintenance-free power. Photovoltaics will be used in increasing quantity by the military, provided the legislative mandate to use life-cycle costing in economic decisions is not abandoned because of budget pressure to lower initial cost. American embassies throughout the world would benefit greatly from photovoltaic energy to ensure continuous self-contained power for lighting and communications.

3.0 PHOTOVOLTAIC TECHNOLOGY PROGRESS

The photovoltaic community began planning the research program necessary to achieve significant manufacturing cost reductions more than 10 years ago. More recently, the photovoltaic industry and research community, working closely with DOE, universities, government laboratories, and electric utilities, has contributed to the development of the DOE Five-Year Research Plan. The Plan's ultimate objective is a reduction in the price of electricity generated by photovoltaics. The Plan identifies the research needed to establish the technology base for large scale commercialization of photovoltaics. Industry, universities, government laboratories, and electric utilities have adopted this plan and are now making exceptional progress toward these common goals, including:

(1) Efficiency - photovoltaic modules will be produced with greater than 15% conversion of sunlight to electricity;

(2) Endurance - photovoltaic modules will operate reliably for more than 20 years;

(3) Manufacturability - the feasibility of low cost production is now being established.

As a demonstrated measure of progress, the industry's manufacturing cost, reflected in product price, has dropped more than an order of magnitude since terrestrial photovoltaic research initiatives began 10 years ago. However, cost must be reduced by at least another factor of five to have large-scale utility impact. This reduction will only come through further aggressive research.

4.0 PHOTOVOLTAIC INDUSTRY COMMERCIALIZATION STATUS

Although the PV industry has grown at a greater than 40% compound growth rate over the past ten years, it is still very small. Worldwide revenues for 1985 are estimated to be only $150 million. U.S. private industry currently has approximately 50% of the world market and is investing approximately $60M/yr in research and development. Industry alone cannot afford to support the research base necessary to bring the technology to the next cost/performance plateau. Continuing government help is mandatory to develop the scientific foundations upon which a large-scale industry can grow.

5.0 EFFECT OF PV BUDGET REDUCTIONS

After a decade of building, industrial research, university and national laboratory teams have achieved critical mass. They are enthusiastic, dedicated, and making progress ahead of the timetable. Funding from DOE, through such organizations as SERI, has played a major role in achieving this rate of progress. Complementary government laboratory research has accelerated progress. Overall program coordination has identified common goals. Reduction in federal support will disrupt these unique dedicated research teams halfway through the program. The momentum we have gained may never be recovered and our international leadership position will be lost.

6.0 SUMMARY AND RECOMMENDATIONS

Since 1982, the American photovoltaic research community has experienced budget reductions of greater than two-thirds, from $150M to $50M, while the budgets of Japan and other nations have increased. The DOE Five-Year Research Plan initiated in 1983 was developed on the basis of a budget of approximately $60M per year, which has been more than matched by industrial research funding. Much progress has been made at that level of funding toward establishing the technology base necessary for large scale commercialization of photovoltaics, but much remains to be done. Further budget reductions, coupled with the loss of energy tax credits, will jeopardize the entire industry and the promise of photovoltaics may go unfulfilled.

Based upon these considerations, the photovoltaic community recommends that DOE photovoltaic research funding be continued at a level no lower than that of the last two years, $45M, to sustain the research momentum for this important electric technology. The detailed recommended budget elements are contained in Table I. By providing the necessary research base, the DOE insures that American industry will be able to fulfill photovoltaic technology's promise of both significant contribution to the U.S. energy needs, and to development of a large-scale high technology export industry.

TABLE I

FY 87
BUDGET RECOMMENDATIONS ($ Millions)

1.	Single Junction Thin Films	
	a. a-Si	4.0
	b. High efficiency concepts	4.8
	c. Advanced thin films	6.0
	d. Deposition research	2.0
		$16.8
2.	Multi Junction Concepts	
	a. a-Si	3.8
	b. High efficiency	3.9
		$ 7.7
3.	Innovative Concepts	
	a. New idea	2.0
	b. University Program	3.0
	c. Thin Film encapsulation	1.5
	d. Institutional Issues	1.3
		$ 7.8
4.	Advanced Film Sheet	$ 1.0
5.	Flat Plate Collector	-0-
6.	Concentrator Collector	$ 3.5
7.	Module Reliability	
	a. Thin film	1.5
	b. Concentrator	2.5
		$ 4.0
8.	Army & BOS Development	-0-
9.	Systems experiments	
	a. Utility interface	1.0
	b. Critical components	1.0
	c. Performance measurements	0.5
		$ 2.5
10.	Technology Transfer	$ 1.2
11.	Capital Equipment	$ 2.0
	Total	$46.5

WEDNESDAY, APRIL 9, 1986.

SUBSEABED DISPOSAL PROJECT

WITNESSES

ARMAND J. SILVA, CHAIRMAN, DEPARTMENT OF OCEAN ENGINEERING, UNIVERSITY OF RHODE ISLAND
KENNETH R. HINGA
G. ROSS HEATH

Mr. MYERS. Next, Dr. Armand Silva, Chairman of the Department of Ocean Engineering.

Dr. SILVA. I am Armand Silva, and this is Dr. Ross Heath on my left from Seattle and Dr. Kenneth Hinga on my right. I will try to touch on some of the highlights.

The samples that you see before you are called red clays. These particular samples were obtained from the North Pacific sea floor in water depth of over three and a half miles using a coring device.

There is a map on the cover that shows the location.

This red clay is typical of sediments that blanket vast areas of the world's oceans, areas that are larger than the entire continent of North America.

These clays are inert. They have no value as a resource. You can eat it if you wish, yet they may be a key to a solution for much of the world's growing nuclear waste problem.

Mr. MYERS. I was born and raised on the Wabash. I have seen that mud all my life.

Dr. SILVA. The nuclear waste disposal problem is international in scope, long-term, requires effective isolation for tens of thousands of years, and 26 other nations produce over twice as much waste as the United States.

The present and projected world inventory of high level radioactive waste represents a considerable environmental hazard and it must be dealt with properly.

For various reasons, some other nations may not be able to develop suitable domestic repositories, thus it is important that the United States continue its involvement in research to develop an international repository.

This is the only way we can promote stringent global standards for high level repository waste.

The subseabed disposal research is also very important in other international contexts such as the nonproliferation objectives and technology transfer, which are in my statement.

Deep sea clays possess several attributes that are important. They have low permeability, high absorption potential and they behave like soft plastic material.

The combination of low permeability and high absorption means that, if there are any nucleides released in the sediment, the rate of travel would be small.

The plastic nature of the sediments means we can place them to depths of tens of meters, over a hundred feet, in the sea floor strata.

Based on results to date, these and other properties show that the red clays will provide an effective long-term geologic barrier for nuclear waste.

The subseabed disposal project was started in 1973 by a group of oceanographic scientists and engineers. Most of the United States research has been maintained by academic and research institutions, and we feel it is very healthy to maintain a strong involvement by independent researchers in this very important problem.

The areas that are under study in both the Pacific and the Atlantic oceans constitute some of the geologically most stable areas in the world.

The areas show continuous accumulation of sediment stretching back over many millions of years through many climatic changes with no disturbance or interruptions.

The idea is to bury canisters containing solid nuclear waste far into these fine grain clays and this objective is the same as that used for land based repositories, to isolate the wastes.

In addition to the international benefits, this project offers an alternative to the U.S. land-based options. This study is consistent with evaluating all reasonable media before making all waste management decisions.

We want to determine whether or not the concept is scientifically, environmentally feasible, and the result of a dozen years of research indicate that the concept is sound, but we need a few more years to bring the project to the point policy decisions can be made with competence.

In comparison with the total funds being expended for high level waste disposal, this project is very small, about one percent of the total.

It would not be prudent to terminate the project at this late stage. We are about three-quarters complete, and the concept feasibility could be determined in four to five years, and we request that funds for this very important research be continued so we could get on with our mission.

Thank you.

Mr. MYERS. Thank you, Dr. Silva, for your fine testimony. We were depositing some nuclear waste, toxic waste, in a trench out here in the Atlantic and stopped it because of the danger of contamination against sea life.

Dr. SILVA. Different concept.

Dr. HEATH. We were dumping barrels onto the floor of the ocean. This is a geologic concept of burying them, very different containment.

Mr. MYERS. Do you have to drill holes?

Dr. HEATH. Some experiments have been done by the Europeans, and the U.S. and the British of free-falling canisters from the surface, and they have penetrated a hundred feet into these clays, and so the idea being you get rapid closing of the hole behind the canister and sealing off the waste.

Mr. MYERS. Okay.

Well, thank you very much.

[The statement of Armand J. Silva follows:]

The University of Rhode Island, Narragansett, RI 02882 1197
Marine Geomechanics Laboratory, College of Engineering
Narragansett Bay Campus, OE-2, 401-792-6191, 6194

MEMORANDUM

TO: The Energy and Water Development Subcommittee on Appropriations
The Honorable Tom Bevill, Chairman

RE: List of Witnesses
Subseabed Disposal Project
April 9, 1986

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Director, Marine Geomechanics Laboratory
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TESTIMONY BEFORE
THE ENERGY AND WATER DEVELOPMENT SUBCOMMITTEE ON APPROPRIATIONS
APRIL 9, 1986 CONCERNING
THE SUBSEABED DISPOSAL PROJECT
Written Statement by:

Dr. Armand J. Silva, Chairman and Professor
Department of Ocean Engineering, Univ. of Rhode Island

Dr. Kenneth R. Hinga
Senior Scientist, Deuel and Assoc., Albuquerque, NM, and
Visiting Scientist, Graduate School of Oceanography, Univ. of Rhode Island

Dr. G. Ross Heath, Dean and Professor
College of Ocean & Fisheries Sciences, Univ. of Washington

SUMMARY OF REQUEST: We request that funding for the Department of Energy Subseabed Disposal Project be continued at $9.6 million in FY-87. There are many benefits to the U.S. in completing the current phase of the research.

SPECIFIC ACTION: The Subseabed Disposal Project requires approximately $10.0 million per year to continue research on each of the topics required to evaluate disposal and containment of high-level radioactive wastes in stable geologic formations beneath the ocean floor. With the continued cooperation of the nine other nations conducting subseabed research, the feasibility of subseabed disposal can be determined on scientific and environmental grounds with a high degree of confidence in about five years.

ABSTRACT: The objective of the Subseabed Disposal Project (SDP) is to determine the scientific and environmental feasibility of burying canisters of high-level radioactive waste (HLRW) within geologically stable deep-sea sediments. In addition to providing a prudent alternative study to the U.S. land-based disposal option, the U.S. SDP is part of an international research effort with nine other nations. Other nations may find that a subseabed repository is their only viable disposal option, and it is crucial that the U.S. be involved in actions that have global environmental implications. Continuation of the international subseabed research would also help to strengthen nuclear non-proliferation objectives, may help to promote long-term energy stability, and provides an effective means for promoting stringent global standards for waste management.

The deep ocean areas that are being studied are blanketed with thick deposits of fine-grained clays that would provide an excellent barrier between the waste canisters and the biosphere. The study sites are in deep water (over 5000 m), away from geologically active zones, isolated from human activity, and essentially devoid of resources. The canisters would be buried at depths of tens of meters in the sediment.

The current phase of the project, to determine the feasibility of the concept on scientific and environmental grounds is about 3/4 complete. We feel that the program should be continued at a funding level that would provide adequate information in about five years on which to base a credible decision on the desirability of working with other nations for the development of a subseabed repository.

INTRODUCTION TO SUBSEABED DISPOSAL: Subseabed disposal would use stable geologic formations beneath the deep-ocean floor for burial of high-level radioactive waste. Packaged solid wastes would be placed, individually or in stacks of canisters, a few tens of meters into fine-grained ocean sediments that would provide an effective barrier between the waste and biosphere. The concept is similar to that of land-based mined repository disposal in that the objective of the burial is to achieve long term isolation of the wastes from environments accessible to man. Evaluation of the subseabed concept differs somewhat from that of mined repository disposal options in that a subseabed repository would most likely be international and open to utilization by other nations. Also, the presence of the large volumes of ocean water need to be considered in the assessment of environmental effects.

The overall goal of the program is to determine whether the concept of subseabed disposal is feasible on scientific, technological, and environmental grounds. Laboratory and field studies are being coupled with an extensive mathematical modeling effort aimed at describing the actual long-term performance of a repository. Research topics include: site studies to identify suitable seafloor study areas, sediment barrier studies, environmental studies, engineering studies on emplacement technology, radiological assessment studies and institutional studies including national/international issues and public participation.

Research to determine the feasibility of subseabed burial of HLRW has been underway in the U.S. at a modest level for the last 13 years (total of $63 million). Japan, Canada, Belgium, the Netherlands, France, the Federal Republic of Germany, the United Kingdom, Italy, and Switzerland are presently conducting research on the concept at a combined funding level greater than that of the U.S. project (a total of $76 million over the last 10 years). The international program is coordinated through participation in the Seabed Working Group of the Nuclear Energy Agency.

The current phase of the U.S. project concentrates primarily on determination of the radiological consequences of subseabed disposal and on identification of suitable geologic formations. The near term objective is to have an observational basis (actual experimental or field data) for each step in the computation of radiological effects that would result from a subseabed repository. This means that data will be collected, if they are not presently available, to quantify each process that affects the containment in a repository or the transport of radionuclides through the environment. This work will bring the project to a stage where a general assessment of the concept can be made. The research is not site specific at this time, although a preliminary characterization will be made of at least one promising area in each of the northern Atlantic and Pacific Oceans. This includes mapping the three-dimensional sedimentary structure of the locations and developing an understanding of the geological processes at the site.

The current phase of the U.S. project is approximately 3/4 complete. At the end of this stage, a highly reliable assessment of the scientific and environmental feasibility of subseabed disposal will be available for making decisions on the desirability of development of subseabed repositories. With the completion of this phase the U.S. would be in a very credible position to influence the international decisions on subseabed repositories. If subseabed repositories are developed, the U.S. might also choose to utilize the subseabed option for a portion of its HLRW.

INTERNATIONAL BENEFITS OF CONTINUED RESEARCH: There are currently 26 nations utilizing nuclear power: Argentina, Belgium, Brazil, Bulgaria, Canada, Czechoslovakia, Finland, France, the Federal Republic of Germany, German Democratic Republic, Hungary, India, Italy, Japan, the Netherlands, Pakistan, the Republic of

Korea, South Africa, Spain, Sweden, Switzerland, Taiwan, the United Kingdom, the United States, the Soviet Union, and Yugoslavia. In addition, the People's Republic of China, Cuba, Mexico, Poland, the Phillipines, and Rumania may be added to the list in the next few years. Fifty three nations have research reactors. The non-U.S. production of HLRW is presently about three times that of the U.S. Unlike the situation in the U.S., many nations are planning a continued growth in their use of nuclear power. The world inventory of HLRW represents a considerable environmental hazard if not dealt with properly. Even if all nuclear power could be halted today HLRW repositories would still need to be developed. Some nuclear nations do not have domestic geologic formations suitable for a HLRW repository. Other nuclear nations that have purchased reactors but may not have the technical expertise to develop an acceptable repository. And, those nations running only a few reactors may not have the economic resources to develop a repository. If any nation fails to properly dispose of HLRW, whether on land or under the oceans, the future generations of all nations will suffer the consequences. If an international repository of high performance standards were available, the prospects for proper HLRW disposal would be greatly enhanced.

The "global commons" of the deep ocean floor is by far the best prospect for the location of an international repository. The costs of repository development and operation would be shared, no nation would be required to accept the wastes produced by others, and the entire process of waste management would be stringently controlled.

An international repository would remove an impediment to nuclear energy development, if needed, for nations with no other domestic sources of energy and would therefore help promote long-term global energy stability. An international repository would also aid in non-proliferation by closing the nuclear fuel cycle, reducing the number of facilities requiring verification, reducing the incentives for undesirable transfers, and thereby strengthen the Nuclear Non-proliferation Treaty.

Continued participation in subseabed disposal research is an effective mechanism for the U.S. to influence the high-level waste management activities of other nations, to promote stringent global standards for HLRW repositories, and to participate in what may be a good solution to a growing environmental danger. In addition, there are foreign policy benefits for the U.S. to use international cooperation in subseabed research as a technology transfer program. Both the Nuclear Non-proliferation Treaty and the Nuclear Waste Policy Act mandate such cooperation. Waste management technology is certainly a type of expertise we should wish to export.

DOMESTIC BENEFITS OF CONTINUED RESEARCH: The U.S. is fortunate to have a variety of geologic formations and the economic strength to research and develop repositories. Nevertheless, reviewers of nuclear waste management policy, including the Interagency Review Group (1979), The Office of Technology Assessment (1982, 1985) and the National Advisory Committee on Oceans and Atmospheres (1984), have all recommended that it is prudent for the U.S. to conduct research on alternatives to the primary HLRW disposal option of mined repositories. The Nuclear Waste Policy Act (1982) stipulates that research into alternative means for permanent disposal of HLRW be continued. At this time subseabed disposal is the only alternative being studied in detail.

The results of the Subseabed Disposal Project will also be useful for the evaluation of the role of the ocean environment in the disposal of other types of hazardous wastes. The models under development for sediment barrier assessment, dispersion, chemical scavenging and biological transport are the most advanced developed by any ocean waste evaluation program. In addition the project has been responsible for significant advances in marine sciences, most notably in ocean instrumentation, deep-sea biology, and deep ocean-basin geology. Most of the research

funding has gone to universities and oceanographic institutes. This has resulted in numerous side benefits, including the training of graduate students in science, engineering, and other disciplines and involvement of a greater number of scientists in waste management problems.

RATIONALE FOR CONSIDERATION OF SUBSEABED GEOLOGIC FORMATIONS: Consideration of oceanic regimes for possible containment of HLRW is consistent with the philosophy of evaluating different geologic media and options for waste disposal decisions. The total area of the ocean is 361 million km^2, or over 70% of the surface of the earth. The oceans, like land, have a variety of geologic formations. In the early stages of the program, careful consideration was given to all the oceanic regimes ranging from nearshore and coastal areas to deep ocean basins and subduction zones. Based on comparative studies and general criteria established for a nuclear waste repository, the reasonable options were gradually narrowed down by a process of elimination. Some of the geologic formations, such as abyssal hills and distal edges of abyssal plains, when found in what are referred to as mid plate/ mid gyre (MPG) areas, have characteristics which are desirable for HLRW disposal and are the focus of research.

The sediments in the MPG areas under study, which are in water depths of over 5000 meters, are some of the most stable geologic formations on earth. The MPG areas have vast sedimentary deposits and are away from the edges of tectonic plates where seismic activity is concentrated. The sediments are being formed by slow but continuous deposition of fine particles. For example, some of the regions that have been sampled show continuous deposition, without measureable erosion, for tens of millions of years. The sediments in some areas are essentially uniform laterally for hundreds of kilometers, which greatly simplifies the site characterization process.

The clayey sediments themselves have several properties that make them attractive for radioactive waste disposal. They are made up of very small grains that are highly nuclide-adsorbing, thus slowing nuclide movement. The mineralogical composition and arrangement of these fine-grained materials are such as to make the sediment very resistant to water movement, whether natural or induced. Hence, the mass movement of water through the sediment is extremely slow. The primary transport mechanism through the sediments would be molecular diffusion, a very gradual process which is slowed even more by nuclide adsorption onto the sediment grains. The sediments are also "plastic" (they do not fracture and form cracks when disturbed thermally or mechanically), they tend to flow when displaced and cavities resulting from canister emplacement will close. The relatively low strength and healing property of the sediments allow emplacement techniques not feasible in higher-strength disposal media. The high pressures in the deep ocean (about 500 atm) are beneficial because they assure that the sediments will remain saturated and that the pore water (i.e., water in the sediment) will not boil. Also, temperatures in the deep ocean are low (about $2^{\circ}C$), providing an excellent heat sink for the heat produced by the waste.

The waters of the deep oceans also have advantageous properties that are relevant to the overall assessment of the subseabed concept. Ocean waters contain $5x10^{11}$ curies of naturally occurring radionuclides as part of the total salts of sea water. For comparison, the entire 1981 inventory of commercially generated spent fuel in the U.S. was $1x10^{10}$ curies. If small fractions of radionuclides from a repository operation were to reach the water through accidents, or through predictable and allowable releases a few thousand years after disposal, such releases would not significantly perturb the radiation environment in the ocean. It should also be noted that organisms living in sea water receive background radiation in similar amounts to their terrestrial counterparts. In fact, the largest reported natural radiation doses are to some deep-sea organisms. Thus oceanic organisms do not live in a low radiation

environment which could make them sensitive to additions of radionuclides to their environment.

The net movement of particles in the ocean waters is downward. These particles scavenge elements in the water including many waste elements, and transport them to deeper waters or the ocean floor. This mechanism tends to lower the concentration of the scavenged elements in the surface waters, therefore reducing the accumulation of waste radionuclides in harvestable organisms, most of which live in surface waters. Finally, the volume of the oceans is about 3,000 times that in rivers and lakes. An introduction of radionuclides sufficient to severely contaminate any body of fresh water would constitute a relatively small addition to the oceans.

A subseabed repository large enough to accommodate the HLRW generated by the entire U.S. nuclear power industry (which represents roughly one third the world total) through the year 2000 would require less than 2000 square kilometers, or 0.005% of the world ocean area. The anticipated distance between canisters, about 100 m, is sufficient to assure that there are no significant interactions between implanted canisters. Thus each canister, or stack of a few canisters, would be in its own "mini-repository." An event that might disturb one or a few canisters would not impair the containment of the remainder of the repository.

The size of a repository relative to the size of the oceans also minimizes conflicts with ocean resources. For example, the deep ocean floor, in the types of oceanic geology being considered, has only one potential harvestable resource, manganese nodules. It is likely that mining for nodules would be concentrated in relatively limited and known areas of nodules with high nickel, copper, and cobalt content. These areas are not under consideration for subseabed disposal. However even if a nodule mining operation were carried out immediately on top of a repository, it would not jeopardize radionuclide containment because of the depth to the canisters. The same factors hold true for food resources, shipping lanes, and recreational uses of the oceans: high-use areas are not under consideration, but even if they were, it is very unlikely that the repository (and conversely the human activities) would be adversely affected.

PROGRESS AND PRELIMINARY FINDINGS: Progress has been made in all the areas determined necessary for an authoritative evaluation of the scientific and environmental feasibility of subseabed disposal of HLRW. Models have been developed to describe each step in repository performance and possible transport of radionuclides through the environment. Most of the physical property and behavior data necessary to run the models has been collected. An important step remaining, however, is field validation of model predictions. Present calculations indicate that dose-to-man standards equivalent to the EPA standards being considered for U.S. land based repositories could be easily met by suitable burial in deep ocean sediments. These calcuations include the risks of transportation to the disposal site. Promising sites have been found in both the North Pacific and North Atlantic oceans. Based on the surveys and sampling to date, the study locations have suitable sediment types for disposal and have been free from erosional process during past climatic changes. Higher resolution studies will be conducted to assure that undesirable features not detected by the screening techniques do not exist. Preliminary work, mostly by other Seabed Working Group nations, has shown that implantation of waste canisters to proper burial depth is possible with techniques presently available.

Attachment 1

FACT SHEET

THE SUBSEABED DISPOSAL PROJECT; investigations into the feasibility of disposal of high-level wastes by burial in stable deep-ocean sediments.

Continued participation in the international program to study subseabed disposal is an effective mechanism to influence high-level waste management activities of other nations and, in general, to help advance waste management/environmental sciences worldwide. In this forum the U.S. can promote stringent global standards for HLRW repositories.

If subseabed proves feasible and an international subseabed repository were developed, it would promote proper disposal of HLRW by all nations. Many nations have ambitious nuclear power programs and together other nations will produce a considerably larger inventory of wastes than the U.S. Of the 26 nations currently utilizing nuclear power, some do not have suitable geologic formations for a repository, may not find it economic to develop a suitable repository for wastes from their few reactors, or may not have the domestic technical expertise to develop a repository. An international repository would remove an impediment to nuclear energy development, if needed, for nations with no other domestic sources of energy and would help promote long-term energy stability.

An international repository would aid in non-proliferation by closing the nuclear fuel cycle, reducing the number of facilities requiring verifications, and reducing the incentives for undesirable transfers. An international repository would also strengthen the Nuclear Non-proliferation Treaty itself by removing the significant weakness of an unclosed fuel cycle and by providing a technology transfer as provided for by the treaty.

Reviewers of waste management policy have supported continued investigation into alternatives, especially subseabed disposal, to act as a back-up to land-based mined repositories. The Interagency Review Group (1979), the Office of Technology Assessment (1982, 1985), and the National Advisory committee on Oceans and Atmospheres (1984) have all expressed such support. The Nuclear Waste Policy Act (1982) stipulates that research into alternative means for permanent disposal of HLRW be continued. At this time subseabed is the only alternative being studied.

Methodologies and results generated by the subseabed project will have a direct applicability for evaluation of the fate and effects of other types of wastes introduced into the deep oceans.

The task of evaluating the scientific and environmental feasibility of subseabed disposal is about 3/4 complete. Only after completion of the required research can the decision on whether to develop subseabed disposal be based on an understanding of environmental consequences. If the U.S. is not a participant in the international research, it will not have an effective voice in that decision. Based on the expected expenditures and plans of the other 11 nations participating in subseabed research, the U.S. project will require about $10 million per year (1986 dollars) to complete the evaluation in 1991. At this funding level the U.S. will maintain activity in each of the scientific and technical disciplines which comprise the research. It would cost about $20 million more to stop and restart the research at a later date than to complete the research without a hiatus.

3/7/86 KRH, AJS

Attachment 2

WORLD NUCLEAR POWER
(as of June 30, 1985, from Nuclear News, Aug. 1985)

Nation	number of working reactors	reactors ≥50% complete	reactors <50% complete	LDC sign. (1)	OECD mem. (2)
Argentina	2	1	0	y	
Belgium	5	2	0		y
Brazil	1	0	2	y	
Bulgaria	4	1	0		
Canada	15	4	3	y	y
China	0	1	2		
Cuba	0	2	0	y	
Czechoslovakia	4	6	3		
Egypt	0	0	2		
Finland	4	0	0	y	y
France	43	14	8	y	y
D.R. Germany	5	0	0	y	
F.R. Germany	16	4	2	y	y
Hungary	2	2	0	y	
India	5	1	4		
Italy	3	1	2		y
Japan	31	5	7	y	y
Korea	4	3	2		
Mexico	0	1	1	y	
Netherlands	2	0	0	y	y
Pakistan	1	0	0		
Philippines	0	1	0	y	
Poland	0	0	6	y	
Rumania	0	1	2		
South Africa	1	1	0	y	
Spain	7	3	1	y	y
Sweden	10	2	0	y	y
Switzerland	5	0	1	y	y
Taiwan	6	0	0		
U.K.	37	5	0	y	y
U.S.	88	34	6	y	y
U.S.S.R.	43	16	0	y	
Yugoslavia	1	0	0	y	(y)

1. Nations that are signatories to the London Ocean Dumping Convention (as of January 1, 1983).
2. Nations that are members of the OECD (as of 1984).

The table does not include reactors at any stage of construction (22 reactors) that were listed as having an indefinite start-up date. Many of these appear to be effectively canceled. For many of the Soviet Block nations the original source did not list percent of construction complete. In those cases reactors with a completion date of 1989 or before were counted as ≥50% complete.

KRH, April 1986

Attachment 3

EXCERPTS FROM REPORTS AND LAWS CONCERNING SUBSEABED DISPOSAL:

Office of Technology Assessment, 1982

National Advisory Committee on Oceans and Atmospheres, 1984

Nuclear Waste Policy Act, 1982

Nuclear Non-Proliferation Act, 1978

In 1982 The Office of Technology Assessment (OTA) issued a report titled "Managing Commercial High-level Radioactive Waste". In this report they recommended:

> High redundancy. The program would pursue enough backups to each component of the isolation system and to each candidate site to ensure a high probability that at least one acceptable combination will be available on the target date even though more or less predictable failures occur.
>
> Alternate disposal technologies. A program with high redundancy would include sufficient support for the main backup technology -subseabed disposal- to test its feasibility in the 1990's, so that it could be available as an alternative if unforseen difficulties occur with mined geologic disposal, or so that it could be used as a supplement to such disposal if desired.

In 1981 the National Advisory Committee on Oceans and Atmosphere (NACOA) published a report on non-radioactive waste entitled "The Role of the Ocean in a Waste Management Strategy." In that report the Committee recommended that the oceans be considered along with other options in a multi-media approach to planning for waste disposal. In a second report issued in 1984, "Nuclear Waste Management and the Use of the Sea," they extended their consideration to radioactive wastes. Statements from various parts of the report relating to subseabed disposal include:

> The National Oceanic and Atmospheric Administration (NOAA), the Environmental Protection Agency (EPA), and the Department of Energy (DOE) have responsibility for some aspects of anthropogenic radioactivity in the ocean. Much of our current knowledge comes from the Department of Energy (and its predecessor, the Atomic Energy Commission). DOE is currently funding what is perhaps the best organized and most imaginative research in this area, the Deep Seabed Disposal

Program, which is investigating the possibility of emplacing encapsulated high-level radioactivity 30 to 100 meters deep into the sediments of the ocean floor in water depths of 4,000 to 5,000 meters.

A second NACOA conclusion is that ocean disposal is an international issue. Ocean processes do not recognize national boundaries. We should be concerned not only about U.S. policy for ocean disposal of radioactive material but other nations policies as well. Furthermore, we must assume that any change in U.S. policy on ocean disposal of radioactive waste will strongly influence those of other nations.

In addition to the physical advantages, there may be several other benefits to subseabed disposal. It is in the U.S. interest that other nations dispose of their wastes properly. It is not reasonable to expect small nations that run a few reactors to undergo the huge effort the United States is making to find safe land based repositories. Development of subseabed repository techniques might keep many small users from establishing a variety of land-based repositories of questionable safety standards. Additionally, subseabed disposal may prove beneficial from the standpoint of security and safeguards. Placing HLW in the subseabed in isolated areas under the ocean and its seafloor would set up a major barrier to terrorists attempting to retrieve forms of HLW.

Because deep ocean sites would require high technology to disturb, it seems that ocean disposal could be designed to prevent unintentional human intrusion with more certainty than land disposal options.

We recognize that present U.S. policy presently excludes the ocean as a possible disposal site for radioactive waste. NACOA is concerned that a rigid policy of exclusion will result in so lowering the perceived priority of research as to slow down, if not cut off entirely, Federal agency support of the research. The budget recommendations for the fiscal year 1985 clearly demonstrate the effect of this policy on research.

Present U.S. policy is to find land-based solutions to the question of high-level wastes. As near as NACOA can judge, all other cooperating nations in the deep seabed disposal program have similar policies. However, a number of possible sites in the United States have already been eliminated for disposal of high-level wastes. Perhaps even more importantly, the political issue of local concern, once a final site has been chosen, has not yet been joined. For these reasons, a number of observers believe the possibility of using the deep seabed for emplacement of high-level radioactive waste cannot be dismissed despite present

> official U.S. Policy. Furthermore, other nations such as Japan and the United Kingdom are not as well endowed geologically as is the United States. Lacking suitable land based sites, they may have little choice but to embrace the option, if further research suggests that this is indeed a reasonably safe alternative.
>
> Present evidence suggests that under certain circumstances, at least, the ocean offers an attractive to land-based disposal. If there are reasons why the ocean is unacceptable, we need to know them. Arguing that we cannot use the ocean as a disposal site for radioactive waste because we do not know enough about it may not be politically acceptable to those concerned with land-based disposal in their local communities.

The Nuclear Non-Proliferation Act of 1978 requires the President to:

> (Sec. 104)...institute prompt discussions with other nations..(among other things, for)..establishment of repositories for the storage of spent nuclear fuel under effective international auspices and inspection.
>
> ...to develop international approaches for meeting future worldwide nuclear fuel needs.

The Nuclear Waste Policy Act of 1982 established a national policy for storage and disposal of high-level radioactive and pertinent research and development programs. The Act relates to subseabed disposal research as an alternative where the DOE is to:

> Sec. 222. The Secretary shall accelerate a program of research, development, and investigations of alternative means and technologies for the permanent disposal of high-level radioactive waste from civilian nuclear activities and Federal research and development activities except that funding shall be made from amounts appropriated to the Secretary for purposes of carrying out this section. Such program shall include examination of various waste disposal options.
>
> Sec. 223. (a) It shall be the policy of the United States to cooperate with and provide technical assistance to non-nuclear weapon states in the field of spent fuel storage and disposal.

TESTIMONY FOR HOUSE SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

HOUSE COMMITTEE ON APPROPRIATIONS

April 9, 1986

SOLAR THERMAL TECHNOLOGY

D. J. O'Neil, PhD and H. O. Spauschus, PhD
Energy and Materials Sciences Laboratory
Georgia Tech Research Institute
Georgia Institute of Technology
Atlanta, Georgia 30332

It is the firm belief of the Georgia Institute of Technology that a further erosion of the USDOE solar thermal budget from an average $30M for the last two years to a proposed $15.3M for FY'87 will:

(1) decimate the already-depleted university research programs

(2) isolate "research" activities in one center (SERI) and "engineering" development activities in only one other center (SANDIA, Albuquerque)

(3) dismantle and disperse core teams of veteran solar researchers and technologists

(4) eliminate the training and education of students in preparation for an emerging technology and industry

(5) drive committed U.S. researchers and industrial technology to seek foreign research and commercial development support

(6) surrender previously-funded market and technology leads to foreign competitors.

In 1971, long before the first mideast oil embargo, Georgia Tech researchers became the first U.S. scientific team to conduct experiments at the world's largest solar furnace. By 1977, the Advanced Components Test Facility was built on our campus and has been continually operated on behalf of the U.S. Department of Energy. We have been intimately involved at all stages of the development of solar thermal technology with private industry, university and government laboratories as well as with an international community. We have seen the development of solar thermal technology rapidly climb towards the system - level targets for the mid-to-late 1990's of $0.5/k Whe (electricity) and $9/MBtu (Heat). In addition to Solar Thermal Power Industry, a new cadre of companies, much more broadly based and drawn from aerospace (including space commercialization interests), advanced materials, and the specialty chemical industry, are beginning to be attracted by the prospects of solar-unique products and processes using solar thermal technology. To reduce research funding at this stage is to eliminate this new, emerging industrial interest.

Georgia Tech urges the continuation of funding at current levels of approximately $30M and adherence to a consistent multi-year research plan as outlined in the September, 1985 plan of the USDOE Solar Thermal Technology Division. We particularly endorse the following recommendation of the "Report of the Solar Panel of the Energy Research Advisory Board to the United States Department of Energy, December, 1985 (DOE/S-0039):

"Reasonable diversity in laboratory participation in research, along with continuation or even increases in the base of university and industry research activities, must be maintained to provide adequate opportunity for collaboration, competition, creativity and technology transfer and yet assure an efficient and effective use of limited resources.

WEDNESDAY, APRIL 9, 1986.

NUCLEAR MEDICINE

WITNESSES

DR. STANLEY J. GOLDSMITH, PRESIDENT, SOCIETY OF NUCLEAR MEDICINE AND REPRESENTING THE AMERICAN COLLEGE OF NUCLEAR PHYSICIANS

ROBERT H. WILBUR, PhD., DIRECTOR, GOVERNMENT RELATIONS, JOINT OFFICE OF SOCIETY OF NUCLEAR MEDICINE AND AMERICAN COLLEGE OF NUCLEAR PHYSICIANS

Mr. MYERS. Next, Dr. Stanley Goldsmith, representing the American College of Nuclear Physicians.

Dr. Goldsmith, your entire statement will be provided for the record.

Dr. GOLDSMITH. My name is Stanley Goldsmith, Physician and Director of the Department of Physics and Nuclear Medicine at the Mount Sinai Hospital, and Professor of Clinical Medicine at the Mount Sinai Medical Center in New York, and appearing on behalf of the Society of Nuclear Medicine of which I am the President, and the American College of Nuclear Phsyicians.

And together these organizations represent over 10,000 members and represent the Nation's nuclear medicine community, both practice and research.

And on my left is Dr. Robert Wilbur, Government Affairs Coordinator for both the Society and the College.

We are here to support an appropriation of $23.3 million for the nuclear medicine applications program of the Department of Energy in fiscal year 1987. Although this is significantly below the level needed to adequately support existing facilities or to take full advantage of research opportunities now evident, this appropriation would at least maintain DOE nuclear medicine research at its current level.

Research in the medical applications of nuclear energy is one of the least known activities within the Department. The application of radioisotopes in the diagnosis and treatment of disease, however, is one of the great accomplishments of the nuclear age. In this era of increasing pressures for cost containment and cost effectiveness in health care, the economic benefits of continued research are even more striking.

We are submitting for the record a statement which outlines some of the most promising areas of progress in nuclear medicine. We understand the budgeting discipline under which the government must operate and the need for careful scrutiny and efficient management of all Federal expenditures. Research in nuclear medicine undertaken by DOE in recent years is already showing results which more than justify these expenditures. Promising areas of future research are evident which will clearly repay further investments.

Positron emission tomography, which has been developed in large part by DOE laboratories, is providing a new tool to measure metabolic activity. This is already in clinical application in evaluation of cardiac and neuropsychiatric patients.

We are learning for the first time how brain functions differ from normal, for example, in patients with schizophrenia and Alzheimer's disease. This research must continue to be supported.

Another example is the development of monoclonal antibodies to deliver a radionuclide directly to tumors. This is a promising therapeutic use of nuclear medicine which has benefited from past and present DOE programs.

Many research centers which utilize radioactive tracers depend on the supply of new and sometimes costly radioisotopes available only from government facilities. For example, Oak Ridge is the sole domestic source of certain stable isotopes necessary for the production of radionuclides used in heart and pediatric nuclear imaging. Production of these isotopes and their provision to academic researchers is a critical activity of DOE.

It is most important to have the best possible insight into the research most likely to yield advances which can be translated into clinical applications five years off. The nuclear medicine community stands ready to assist the DOE—and, of course, this committee—in reviewing research opportunities, assuring that these research programs continue to prove a wise investment of Federal funds.

I would like to mention one other subject under the jurisdiction of this committee. The Nuclear Regulatory Commission sets the training requirements for physicians who use radionuclides. The process of acquiring clinical competency to use radioactive materials in humans cannot be short circuited without potential risk to the general public and escalation of health care costs associated with inappropriate or inadequate procedures.

The NRC last year held a meeting of its advisory committee on the medical use of isotopes to review proposals to reduce its training and experience criteria in cardiovascular imaging only. The American College of Cardiology, the Society of Nuclear Medicine and the American College of Nuclear Physicians all concurred that the requirements could safely be reduced to a training program totaling four months for limited applications, such as cardiac imaging only, but that six months of training and experience continue to be the minimum standard for multiple organ system licensure.

The society and the college continue to support meaningful regulations that protect the public. We would point out that regulations without any positive impact on public safety would be tantamount to no regulation at all which in this instance could be both dangerous and wasteful.

Mr. Chairman, thank you for this opportunity.

[The statement of Dr. Goldsmith follows:]

STATEMENT OF

STANLEY J. GOLDSMITH, M.D.

ON BEHALF OF THE

SOCIETY OF NUCLEAR MEDICINE

AND

AMERICAN COLLEGE OF NUCLEAR PHYSICIANS

CONCERNING THE

DEPARTMENT OF ENERGY'S FISCAL YEAR 1987 BUDGET

BEFORE THE

SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

OF THE

HOUSE APPROPRIATIONS COMMITTEE

APRIL 9, 1986

Mr. Chairman, members of the Subcommittee, the Society of Nuclear Medicine (Society) and the American College of Nuclear Physicians (College) are pleased to offer the following statement regarding the Fiscal Year 1987 budget for the Department of Energy.

The Society of Nuclear Medicine is a scientific organization of 10,0000 members including physicians, physicists, chemists, radiopharmacists, technologists, and other professionals engaged in the medical use of radioactive materials. The College is a professional organization representing more than 1,200 physicians and scientists actively engaged in the practice of Nuclear Medicine. The combined membership of these two organizations constitutes the Nuclear Medicine community of this country.

Both organizations strongly support the funding of Nuclear Medicine research through the Department of Energy's Nuclear Medicine Applications Program in FY 1987 at no less than this year's level of $23.3 million, slightly higher than recommended by the Administration. We are aware that this committee has supported increases in Nuclear Medicine research in the past. At this level, we believe that Nuclear Medicine research is underfunded, and we hope that it will be possible to add to these funds in future years.

The College and Society are fully cognizant of the severe budget constraints that the Congress, and your Subcommittee, must work under in addressing FY 87 budget needs. However, it has been our experience that in the field of Nuclear Medicine the applications of basic research activities lead to extraordinary health benefits and cost savings for the American public. Past research resulting from DOE's Nuclear Medicine Applications Program, designed to enhance the application of both radioactive and stable isotopes, has produced benefits which we will outline.

In a typical Nuclear Medicine procedure, the imaging study, a very small amount of a radioactive preparation is administered by injection. This tracer may be designed specifically to concentrate in one body organ, or to be metabolized or removed from the body by a particular route. Some radioactive drugs are designed to concentrate only in abnormal tissue such as cancer cells or compromised heart muscle. Sophisticated instrumentation records the transit and images the distribution of the radioactive preparation in the body. Data derived from the examination may also be processed by computer, producing improved images and quantitative information about organ function. Organ systems, even specific clusters of cells, routinely examined in this fashion include brain, lungs, liver, kidneys, bone, thyroid, pancreas, heart, and major blood vessels.

Diagnostic in vitro examinations encompass certain tests in which no radioactive material is administered to the patient. Instead, a sample of some body fluid, usually blood, is collected from the patient and reacted with a radioactive reagent in a test tube. These tests are used to determine the presence of hepatitis, pregnancy, and cancer antigens, to determine the precise concentration of various hormones, vitamins and drugs, and to identify pollutants or other toxic materials in the environment. Radioimmunoassay techniques permit early discovery of tumors and matastases before they become evident clinically.

Nuclear Medicine techniques are especially versatile for basic research in the chemical, biological, and physical sciences. Since techniques are similar, data in these areas are easily expanded into clinical research allowing rapid application of information from the research laboratory to clinical practice. The following are a few of many such applications, demonstrating the importance of a continuing high level of research:

(A) Cardiac Nuclear Imaging

One of the most dramatic examples of the rapid transfer of research developments to the hospital is the noninvasive study of the human heart. Heart attacks kill approximately 700,000 people annually and are the leading cause of death in the United States. Almost 300,000 individuals suffer their first heart attack without prior knowledge of having significant coronary disease. Early identification of persons at risk had heretofore been particularly difficult. Nuclear diagnostic techniques developed and applied within the past four years are significantly more sensitive and less risky in identifying individuals with diseased coronary arteries (hence at risk) than are other diagnostic methods such as electrocardiographic stress testing, and much less expensive and hazardous than coronary arteriography. Positron emission tomography, developed in large part by DOE laboratories, is the only method of measuring the metabolic activity of heart muscle in a non-invasive manner.

(B) Cancer Patient Evaluation

The major emphasis of Nuclear Medicine in the field of cancer has moved from the therapeutic use of radioactive materials to the use of improved imaging modalities which permit earlier detection and better staging of cancers. In addition, there is growing use of Nuclear Medicine in monitoring the therapy of cancer and early discovery of recurrent or disseminated cancer. This information allows the clinician to continue or modify treatment accordingly. Among the most serious problems in cancer chemotherapy are the serious side effects that anticancer drugs produce. Such effects can often be more efficiently monitored through the use of Nuclear Medicine procedures. For example, certain cancer drugs can adversely affect the heart muscle. Nuclear Medicine methods provide a guide to therapy whereby this toxicity and the possibility of drug induced heart failure can be avoided.

Despite this progress, present technology cannot pinpoint very small growths and often cannot determine their nature. Therefore, these techniques need to be improved by development of more specific radioactive drugs, by exploration of more sophisticated immunologic and biochemical methodology, and by development of instruments with better spatial resolution (such as that offered by emission tomographic techniques). Research with radiolabeled monoclonal antibodies as well as development of compounds that accumulate specifically in receptors only contained in breast tumors are examples of a promising new approach that is being pursued.

(C) Patient Treatment

Improvements in cancer therapy have come about by the development of improved radiotherapy beams, better localization of the tumor, computer-aided treatment planning, and new chemotherapy agents and regimens. Further benefits derived from the use of charged heavy particles (protons, alpha particles, and mesons) arise from better dose distributions, and impressive advantages have been demonstrated in the treatment of benign and malignant growths in the brain. Reduced morbidity and mortality and decreased cost to the patient are achieved from these procedures. The facilities needed for these treatments are only present at DOE National Laboratories and major research centers. Additional support is needed to develop specialized low cost accelerators dedicated for medical purposes.

2. Heavy Ion Therapy

Heavy ions are being used at the Lawrence Berkeley Laboratory for the treatment of blood vessel malformation in the brain. Approximately 10,000 Americans per year are found to have this condition which is not readily treatable surgically. These patients benefit from this new mode of treatment which has been developed with DOE support in the last two years. This program also has proceeded to the treatment of other tumors, with major new successes in the treatment of tumors of the eye and spinal cord.

3. Labeled Monoclonal Antibodies

Labeled monoclonal antibodies offer the promise for the treatment of certain cancers using the specificity of the antibodies to the tumor as a way of localizing the dose. These studies in many instances are provided through collaboration between National Laboratories (Lawrence Berkeley Laboratory, Brookhaven, Los Alamos, Oak Ridge), and Universities (George Washington University, Washington University in St. Louis, University of California at Davis, University of Kentucky, and others).

(D) Instrumentation Development

Important new knowledge of brain function in health and disease has been obtained by the use of positron emission tomography (PET) imaging. PET systems have improved in performance significantly, but the ability to resolve small structures discretely is much less than what is possible and cost is still too high for all but a few research centers. Further improvements in instrumentation are needed to characterize small structures of importance. Developments in high energy physics instrumentation need to be adapted to medical applications to achieve optimal resolution and diminished cost. A five-fold decrease in cost seems realistically achievable with a two-to-three-fold improvement in resolution, given funding for instrumentation support for medical applications at the National Laboratories.

Since PET technology requires an on-site cyclotron and is expensive, the potential of single photon emission tomography (SPECT) is being widely explored. If perfected, this technology would be readily available widely without much additional expense, since the basic instruments are already present in most Nuclear Medicine departments. Research for instrument modification and SPECT radiopharmaceutical development is heavily dependent on DOE support.

(E) Pediatric Nuclear Medicine

Further examples of the improvement in health care from research and development in Nuclear Medicine techniques are in the area of pediatric medicine. A Nuclear Medicine bone scan is the most effective technique for the early differentiation of bone infection from soft-tissue infection, disorders that are clinically similar, but markedly different in treatment and outcome. A Nuclear Medicine liver excretion study is the only method short of exploratory surgery to differentiate blocked bile ducts from liver inflammation in jaundiced newborn infants, who tolerate surgery very poorly.

Short-lived isotopes available only from DOE facilities permit repeated determination of cardiac function with exercise or administration of drugs, particularly important in pediatrics because children change for better or worse much faster than adults, making speed in diagnosis critical. Isotopes with short half-lives deliver much lower radiation doses to patients.

(F) Aging and Atherosclerosis

Nuclear Medicine provides noninvasive methods of studying changes of brain metabolism during normal aging. Of significance are the initial results of DOE supported research on Alzheimer's disease. A group of collaborating investigators supported in the main by the Department of Energy's high technology program on nuclear instrumentation and the National Institutes of Health have discovered a pattern of decreased glucose metabolism occurs in specific areas of the brain in patients with this disease. If these observations are confirmed, it may be possible, for the first time, to identify patients with Alzheimer's disease. Precise dagnosis of a disease must be possible before effective treatment can be developed.

Atherosclerosis research has benefitted in two major areas. It is now possible using Nuclear Medicine advances in positron emission tomography and single photon tomography to evaluate the efficacy of methods of treatment for stroke and heart attacks. These advances come from developments in instrumentation physics provided through the unique capabilities of the National Labs and from new radiopharmaceuticals. For example, at present, Brookhaven National Laboratory produces the purest form of the tracer Iodine-123 for use in synthesizing compounds to study stroke. The major, and for practical purposes, only source of Strontium-82 which is needed for production of Rubidium-82 used in imaging blood flow of the heart muscle is at Los Alamos National Laboratory. A super high resolution positron emission tomograph which will provide the capabilities for the time to evaluate metabolic activity in small regions of the

brain and heart is being studied by the Department of Energy at Lawrence Berkeley Donner Laboratory.

(G) Mental Disorders

One of the major contributions made through collaborative work between National Labs and Universities, e.g., New York University, Cornell, and Brookhaven, is the investigation of the metabolic patterns of the brain in schizophrenia. This is still an area of great controversy; however, for the first time in centuries, there appears to be a quantitative tool whereby this disorder can be studied in a systematic fashion using noninvasive techniques. Work is also being carried out on studying various receptor systems such as the dopamine and morphine receptors which are involved in a variety of mental disorders.

Consultation with Department of Energy

As stated at the outset, we support a continuation of the DOE Nuclear Medicine Applications Program for FY 1987 at this year's level of $23.3 million. This is minimal to maintain progress. Nuclear Medicine research is underfunded in relationship to the benefits produced in the past and which can clearly be expected in the future. Some important research facilities are not being maintained. Opportunities are being missed or their realization delayed.

We also want to assure the Committee that the Nuclear Medicine community will continue to work closely with the Department of Energy in the development of its research programs. Judgments on the areas of research most likely to lead to clinical applications five years out are difficult. We stand ready to help this Committee and the Department of Energy to identify important new directions in diagnostic imaging and therapy. The exchange of views and knowledge between DOE officials and the medical community helps to assure that the greatest possible benefit is derived from the funds committed.

NRC Licensing of Physicians

I would like to mention one other subject under the jurisdiction of this Committee. The Nuclear Regulatory Commission, as you know, sets the training requirements for physicians who use radionuclides in humans for diagnosis or therapy. As is evident from the discussion above, these are complex procedures. The process of acquiring clinical competency to use radioactive materials in humans, for any application, cannot be short circuited without potential risk to the general public.

The NRC last year held a meeting of its Advisory Committee on the Medical Use of Isotopes to review proposals to reduce its training and experience criteria in cardiovascular imaging only. The

American College of Cardiology, the Society of Nuclear Medicine and the American College of Nuclear Physicians all concurred that the requirements could safely be reduced to a well defined training program totaling four months for cardiac imaging only. However, the NRC staff recently sent to the ACMUI for comment a proposal which would reduce these training criteria far more severely.

The Society and the College continue to support meaningful regulations that protect the public. We would point out that regulations without any positive impact on public safety are tantamount to no regulations at all. We are unaware of any data which would cause our respective organizations to reconsider their recommendations. The Society and the College have recently reaffirmed that the training and experience criteria for single organ cardiac imaging could safely be reduced from six to four months, but not lower, and that six months of training and experience continue to be the minimum standard for multiple organ system licensure.

59-750 O—86——21

MR. CHAIRMAN, I AM STANLEY J. GOLDSMITH, M.D., DIRECTOR OF THE DEPARTMENT OF PHYSICS-NUCLEAR MEDICINE AT MT. SINAI HOSPITAL IN NEW YORK AND PROFESSOR OF CLINICAL MEDICINE AT THE MT. SINAI MEDICAL CENTER. I AM APPEARING TODAY ON BEHALF OF THE SOCIETY OF NUCLEAR MEDICINE, OF WHICH I AM PRESIDENT, AND THE AMERICAN COLLEGE OF NUCLEAR PHYSICIANS.

WE ARE HERE TO SUPPORT AN APPROPRIATION OF $23.3 MILLION FOR THE NUCLEAR MEDICINE APPLICATIONS PROGRAM OF THE DEPARTMENT OF ENERGY IN FISCAL YEAR 1987. ALTHOUGH THIS IS SIGNIFICANTLY BELOW THE LEVEL NEEDED TO ADEQUATELY SUPPORT EXISTING FACILITIES OR TO TAKE FULL ADVANTAGE OF RESEARCH OPPORTUNITIES NOW EVIDENT, THIS APPROPRIATION WOULD AT LEAST MAINTAIN DOE NUCLEAR MEDICINE RESEARCH AT ITS CURRENT LEVEL.

RESEARCH IN THE MEDICAL APPLICATIONS OF NUCLEAR ENERGY IS ONE OF THE LEAST KNOWN ACTIVITIES WITHIN THE DEPARTMENT. THE APPLICATION OF RADIOISOTOPES IN THE DIAGNOSIS AND TREATMENT OF DISEASE, HOWEVER, IS ONE OF THE GREAT ACCOMPLISHMENTS OF THE

NUCLEAR AGE. IN THIS ERA OF INCREASING PRESSURES FOR COST CONTAINMENT AND COST EFFECTIVENESS IN HEALTH CARE, THE ECONOMIC BENEFITS OF CONTINUED RESEARCH ARE EVEN MORE STRIKING.

WE ARE SUBMITTING FOR THE RECORD A STATEMENT WHICH OUTLINES SOME OF THE MOST PROMISING AREAS OF PROGRESS IN NUCLEAR MEDICINE. WE UNDERSTAND THE BUDGETING DISCIPLINE UNDER WHICH THE GOVERNMENT MUST OPERATE AND THE NEED FOR CAREFUL SCRUTINY AND EFFICIENT MANAGEMENT OF ALL FEDERAL EXPENDITURES. RESEARCH IN NUCLEAR MEDICINE UNDERTAKEN BY DOE IN RECENT YEARS IS ALREADY SHOWING RESULTS WHICH MORE THAN JUSTIFY THESE EXPENDITURES. PROMISING AREAS OF FUTURE RESEARCH ARE EVIDENT WHICH WILL CLEARLY REPAY FURTHER INVESTMENTS.

POSITRON EMISSION TOMOGRAPHY, WHICH HAS BEEN DEVELOPED IN LARGE PART BY DOE LABORATORIES, IS PROVIDING A NEW TOOL TO MEASURE METABOLIC ACTIVITY. THIS IS ALREADY IN CLINICAL APPLICATION IN EVALUATION OF CARDIAC AND NEUROPSYCHIATRIC PATIENTS.

WE ARE LEARNING FOR THE FIRST TIME HOW BRAIN FUNCTION DIFFERS FROM NORMAL, FOR EXAMPLE, IN PATIENTS WITH SCHIZOPHRENIA AND ALZHEIMER'S DISEASE. THIS RESEARCH MUST CONTINUE TO BE SUPPORTED.

ANOTHER EXAMPLE IS THE DEVELOPMENT OF MONOCLONAL ANTIBODIES TO DELIVER A RADIONUCLIDE DIRECTLY TO TUMORS. THIS IS A PROMISING THERAPEUTIC USE OF NUCLEAR MEDICINE WHICH HAS BENEFITTED FROM PAST AND PRESENT DOE PROGRAMS.

MANY RESEARCH CENTERS WHICH UTILIZE RADIOACTIVE TRACERS DEPEND ON THE SUPPLY OF NEW AND ~~OF~~ SOMETIMES COSTLY RADIOISOTOPES AVAILABLE ONLY FROM GOVERNMENT FACILITIES. FOR EXAMPLE, OAK RIDGE IS THE SOLE DOMESTIC SOURCE OF CERTAIN STABLE ISOTOPES NECESSARY FOR the production of radionuclides used in HEART AND PEDIATRIC NUCLEAR IMAGING. PRODUCTION OF THESE ISOTOPES AND THEIR PROVISION TO ACADEMIC RESEARCHERS IS A CRITICAL ACTIVITY OF DOE.

IT IS MOST IMPORTANT TO HAVE THE BEST POSSIBLE INSIGHT INTO THE RESEARCH MOST LIKELY TO YIELD ADVANCES WHICH CAN BE TRANSLATED INTO CLINICAL APPLICATIONS FIVE YEARS OFF. THE NUCLEAR MEDICINE COMMUNITY STANDS READY TO ASSIST THE DOE -- AND, OF COURSE, THIS COMMITTEE -- IN ASSURING THAT THESE RESEARCH PROGRAMS CONTINUE TO PROVE A WISE INVESTMENT OF FEDERAL FUNDS.

I WOULD LIKE TO MENTION ONE OTHER SUBJECT UNDER THE JURISDICTION OF THIS COMMITTEE. THE NUCLEAR REGULATORY COMMISSION SETS THE TRAINING REQUIREMENTS FOR PHYSICIANS WHO USE RADIONUCLIDES. THE PROCESS OF ACQUIRING CLINICAL COMPETENCY TO USE RADIOACTIVE MATERIALS IN HUMANS CANNOT BE SHORT CIRCUITED WITHOUT POTENTIAL RISK TO THE GENERAL PUBLIC AND ESCALATION OF HEALTH CARE COSTS ASSOCIATED WITH INAPPROPRIATE OR INADEQUATE PROCEDURES.

THE NRC LAST YEAR HELD A MEETING OF ITS ADVISORY COMMITTEE ON THE MEDICAL USE OF ISOTOPES TO REVIEW PROPOSALS TO REDUCE ITS TRAINING AND EXPERIENCE CRITERIA IN CARDIOVASCULAR IMAGING ONLY.

THE AMERICAN COLLEGE OF CARDIOLOGY, THE SOCIETY OF NUCLEAR MEDICINE AND THE AMERICAN COLLEGE OF NUCLEAR PHYSICIANS ALL CONCURRED THAT THE REQUIREMENTS COULD SAFELY BE REDUCED TO A TRAINING PROGRAM TOTALING FOUR MONTHS FOR LIMITED APPLICATIONS, SUCH AS CARDIAC IMAGING ONLY, BUT THAT SIX MONTHS OF TRAINING AND EXPERIENCE CONTINUE TO BE THE MINIMUM STANDARD FOR MULTIPLE ORGAN SYSTEM LICENSURE.

THE SOCIETY AND THE COLLEGE CONTINUE TO SUPPORT MEANINGFUL REGULATIONS THAT PROTECT THE PUBLIC. WE WOULD POINT OUT THAT REGULATIONS WITHOUT ANY POSITIVE IMPACT ON PUBLIC SAFETY WOULD BE TANTAMOUNT TO NO REGULATION AT ALL WHICH IN THIS INSTANCE COULD BE BOTH DANGEROUS AND WASTEFUL.

Mr. MYERS. Thank you, Doctor. The committee has supported the program in the past, both in research as well as applied. It is an exciting and very necessary field. Alzheimer's disease seems to be spreading. We do certainly thank you for your fine testimony and congratulate you on the fine work you are doing. We have always put extra in there because we are afraid it may be one of us.

We have visited the laboratories and have seen the work you are doing. We thank you.

[The following statements were provided for the record:]

GRI

1331 Pennsylvania Avenue, N.W.
Suite 730 North
Washington, D.C. 20004-1703
202/662-8935

DAVID O. WEBB
Senior Vice President,
Policy and Regulatory Affairs

April 8, 1986

The Honorable Tom Bevill, Chairman
Subcommittee on Energy and Water Development
Committee on Appropriations
United States House of Representatives
2362 Rayburn House Office Building
Washington, DC 20515

Dear Mr. Chairman:

I respectfully request that you include the attached testimony as part of the hearing record for hearings held by the Energy and Water Development Subcommittee during the week of April 7, 1986. The Gas Research Institute appreciates the support you and your staff have given in the past and we look forward to its continuation.

Thank you for your consideration of this request.

Sincerely,

David O. Webb

David O. Webb

Attachment
cc: Donald P. Smith

STATEMENT OF DAVID O. WEBB, SENIOR VICE PRESIDENT
POLICY AND REGULATORY AFFAIRS, GAS RESEARCH INSTITUTE
BEFORE THE SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT
COMMITTEE ON APPROPRIATIONS
U.S. HOUSE OF REPRESENTATIVES
APRIL 7, 1986

I appreciate the opportunity to submit testimony outlining the Gas Research Institute's (GRI) views and FY 1987 budget recommendations for establishing a viable hydrocarbon geosciences research program in the Department of Energy's (DOE) Office of Energy Research. GRI is recommending a redirection of $35 million within the total $1.8 billion funding request for programs managed by the Office of Energy Research (OER) to fund the expanded geosciences program.

GRI is an independent, not-for-profit scientific research organization that plans, manages, and develops financing for a cooperative research and development (R&D) program for the mutual benefit of the gas industry and its present and future customers. The Federal Energy Regulatory Commission (FERC) annually reviews and approves GRI's program which is implemented through contracts with research organizations, engineering and other professional service firms, universities, energy companies, and manufacturers. Funding for the GRI R&D program is provided primarily through a funding unit attached to regulated natural gas sales by GRI's 32 interstate pipeline company members. GRI members, subject to appropriate state approvals, also apply a similar charge to their intrastate and direct industrial sales. Even though GRI is not a government contractor and does not accept federal funds, GRI cofunds and coordinates many of its research programs with DOE. Therefore, the actions of Congress on the proposed FY 1987 DOE budget have a direct impact on the gas industry's research program.

GRI believes that the Department of Energy needs to reevaluate its basic energy research program to ensure that there are adequate funds for university- and national-laboratory-oriented research in petroleum geosciences. The proposed FY 1987 DOE budget for basic energy sciences contains only $15 million for geosciences; more than half of these funds are for long-term nuclear waste storage research. Yet, the U.S. is projected to rely on oil and gas to meet approximately 50 percent of its energy demand for the next 25 years. Therefore, GRI is recommending a redirection of $35 million within OER to establish a viable program in hydrocarbon geosciences with emphasis on deep-source gas, methane hydrates, geopressured gas, and related generic reservoir phenomena technology.

RELATIONSHIP TO NATIONAL ENERGY POLICY PLAN

DOE has just finished and transmitted to Congress the fifth National Energy Policy Plan (NEPP). A review of the plan and the accompanying energy projections clearly indicates the following:

1. For the rest of this century, oil and gas are likely to remain the principal energy sources for the American people. They now provide about two-thirds of the commercial energy used in the U.S., and they are projected to furnish more than half in the year 2000. (See Figure V1-2)

2. Domestic reserves of oil and gas generally have been decreasing since the 1970s, and the nation is not finding as much new domestic oil and gas as it produces each year.

3. Enhanced recovery initiatives can coax an additional 14 billion barrels of crude oil from existing U.S. oil fields. The National Petroleum Council estimates that advances in technology could double that increase.

4. With reasonable economic growth, the nation will need between 100 to 300 gigawatts of new capacity over the remainder of the century. If new capacity is not available, utilities will meet additional demand by significantly increasing utilization rates of existing generating units not operating at maximum. Most of this unused capacity is in gas- and oil-fired units. Extended use will increase demand for gas and oil thereby increasing oil imports.

Based on these conclusions and projections, NEPP states, "If this country fails to find and develop new oil and gas fields--and [continues] to squeeze every economical drop from existing reservoirs--it stands a chance of letting the progress (reduced oil imports) of the past few years slip away."

The NEPP in discussing the federal energy research and development role and goals defines the administration's five basic objectives. The first four objectives are met by a viable geosciences research program.

1. To advance scientific and technical knowledge, which is the foundation for technological innovation.

2. To support academic research for the development of basic knowledge.

3. To sponsor cooperatively with industry long-term, high-risk research efforts that are unlikely to be undertaken alone by the private sector.

4. To help train scientific and technical personnel by supporting university research programs.

5. To facilitate the effective transfer of technology, making the results of research and development available widely and promptly in the marketplace.

In fact, without a geosciences program to provide the basic foundation for our national laboratories and universities to train our future petroleum geologists and engineers, geophysicists, and geochemists, the U.S. energy future is destined to include ever-increasing levels of oil imports for the next 15 to 25 years. The proposed geosciences program will provide needed opportunities for our youth to excel in geoscientific disciplines and will help to ensure that the nation will have the technical talent to explore the scientific and technological frontiers necessary to develop our domestic gas and oil resources to the fullest.

SUPPORT FOR DOE GEOSCIENCES PROGRAM

Several other organizations in addition to GRI have recognized the critical importance of an expanded geosciences program in DOE and have endorsed increased funding for this research. The Interstate Oil Compact Commission (IOCC), an organization representing the 30 state governors from producing

states, passed a resolution at its December 1985 annual meeting that urges DOE to expand its geosciences research program. Specifically, the IOCC resolution (see attached) encouraged DOE to:

> . . . promote the use of domestic resources of oil and natural gas to satisfy future demand and, at the same time, to correct the severe imbalance between funding priorities in the energy R&D budget and projected United States demand for energy by shifting sufficient funds within its planned budget to eventually provide for an adequate program in research of geoscientific issues associated with the discovery of oil and gas amounting to approximately $50 million per year; such newly established effort would (1) advance the state of the art in these technologies and (2) through funding at leading universities and other institutions in the field, assure the availability of well-trained professionals in the geoscientific field which will be needed by our country to satisfy the demand for oil and gas, to the maximum extent practicable, from domestic resources.

Just this past week, the Southwest Regional Energy Council, an organization representing the state legislators from the seven oil-producing states in the Southwest, issued a statement regarding national energy research policy. (See attached.) This statement urges DOE to:

> . . .promote the use of domestic resources of oil and natural gas to satisfy future demand. Further, the Council urges DOE to correct the severe imbalance between funding priorities in its energy R&D budget and the projected U.S. demand for energy by shifting sufficient funds within its planned budget to eventually provide for an adequate research program in oil and gas research. This must be accomplished by reallocating funds already committed and not by increased federal spending. A properly balanced R&D budget would advance the state of the art in these technologies and through funding at leading universities and other qualified facilities in the field, assure the availability of well-trained professionals in the geoscientific field which will be needed by our country to satisfy the demand for oil and gas to the maximum extent practicable from domestic resources.

Recognizing that DOE spends a disproportionate share of its resources on high-energy physics and nuclear energy at the expense of geology, geophysics, and geochemistry, all of which will play a greater role in the world's energy situation for at least 35 years, members of the Energy Research Advisory Board (ERAB) established a new Solid Earth Science Panel at its February 5, 1986, meeting. ERAB, the senior advisory body to the Secretary of Energy, was responding to Secretary Herrington's request to review the short- and long-term earth science needs of the energy industries when it established the panel. ERAB selected John Schoettler, a geologist, as the Earth Science Panel's chairman. The panel will review current R&D and arrangements for coordination and cooperation among industry, universities, and federal agencies.

Discussions at the February 5 ERAB meeting focused on the loss of geoscientists in the oil and gas industry, which was attributed to scaled-back exploration and development plans. ERAB members agreed this will come back to haunt the country.

These recent actions by three high-level energy policy advisory bodies clearly demonstrate the urgent need to act now to establish a viable $50 million per year geosciences R&D program in DOE.

LIQUID FUELS OUTLOOK

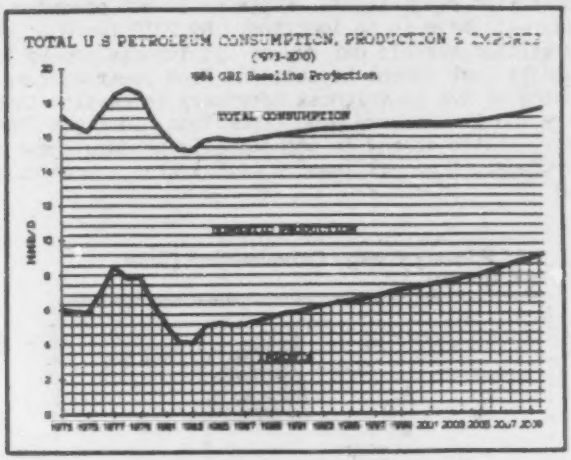
The long-range impact of an unbalanced energy research policy and basic energy research program that essentially ignores domestic petroleum fuels is made clear when you examine the outlook for liquid fuel use in the United States. A major issue highlighted by the 1985 GRI projection of U.S. energy supply and demand is the increasing total demand for liquid fuels and oil imports. The GRI projection assumes that there will be steady economic growth at average historical rates and no increases in the real dollar-denominated world price of oil and that continued conservation trends will moderate demand growth in all of the energy end-use sectors. Still, it is estimated that U.S primary energy consumption will reach nearly 102 quads in the year 2010 with petroleum contributing 35 percent (36 quads) of the total. By comparison, in 1983 the U.S. consumed 31 quads of petroleum.

Petroleum consumption is forecast to increase from 15.2 million barrels per day in 1983 to 16.7 million barrels per day in 2000. In the extended projection, petroleum consumption reaches 17.6 million barrels per day by 2010. While domestic consumption is increasing, the domestic production of crude is expected to decline throughout the projection to 7.8 million barrels per day in 2000--a reduction of more than a million barrels per day from today's production levels. When compared to several major oil companies' forecasts, the GRI projection is relatively optimistic concerning U.S. crude oil production. The oil companies expect domestic crude production to decline faster between 1983 and 2000 to around 6.5 million barrels per day in 2000, or a reduction of over 2.2 million barrels below current production.

The net result of an increasing U.S. demand for petroleum with a simultaneous decline in domestic crude production is an increased dependence on foreign sources of crude. The GRI projection, which was developed before the recent dramatic decline in world oil prices, expects imports to increase to 9.2 million barrels per day in 2010--the greatest demand for imports since the 1977 high of 8.8 million barrels per day. The lower estimates of U.S. crude production from the oil companies would result in even higher levels of imports--over 10.5 million barrels per day.

The impact of low world oil prices on future U.S. oil production is dramatized by the fact that recent U.S. rotary rig counts--the leading indicator of oil and gas drilling activity--reached the lowest level since 1973. In March less than 1200 rigs were in operation compared with an average of 2428 in 1984. Since at least 40 to 50 percent of the domestic oil and gas production in 2000 must come from new reservoirs, the collapse in drilling activity, if it lasts

for several years, will result in less domestic production and more oil imports than projected in current forecasts.



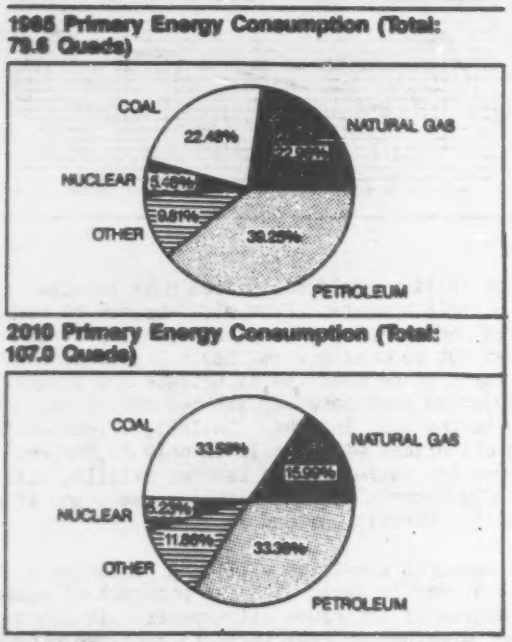
Simultaneously, the falling world oil prices have resulted in major U.S. oil companies' cutting their budgets. From mid-February to mid-March 1986, seven major oil companies reduced planned capital spending by $8 billion. This represents a 25 percent reduction from 1985. Exploration and production budgets were the first to be cut. To illustrate the impact, Data Resources Inc. (DRI) has projected that based on $16-per-barrel oil, only 48,000 wells will be completed in the U.S. in 1986. In 1985, 77,000 wells were drilled. DRI estimates low oil prices will result in only 37,000 wells being drilled in 1987. Bankers Trust Co. estimates the reduced drilling will cut U.S. production by 100,000 barrels per day within a year, and if current trends continue, by 1 million barrels per day in 1990.

By the 1990s, the non-OPEC countries will face declining production levels. As a result, the U.S. may be faced with the prospect of again relying on OPEC oil as the major source of its crude oil imports. It seems probable OPEC will require significant premiums in real terms to increase production to these levels, which would lead to dramatic escalations in the world price for crude at the turn of the century.

National energy policy as modified by Congress has stressed and encouraged development of ample supplies of domestic energy resources and the more efficient use of energy to reduce the dependence on insecure oil imports. A central element of this policy has been congressional initiatives to restore funding for critical long-term nonnuclear energy research programs in DOE. Establishing a viable geosciences program in DOE's Office of Energy Research is critical if the U.S. is to successfully develop the full potential of its vast domestic oil and gas energy resources.

NEED FOR REVISED FEDERAL ENERGY R&D PRIORITIES

GRI estimates that for the next 25 years oil and gas will provide over 50 percent of U.S. energy needs; this is consistent with DOE Energy Information Administration projections. Whatever is not produced from these domestic discoveries will have to be imported. By 2010 the U.S. economy will demand at least 10 million barrels per day of oil imports and up to 7.3 Tcf of natural gas supplements that cannot be supplied from lower-48 supplies without a better understanding of the geosciences necessary to develop technologies to enhance oil recovery and to increase production from tight gas formations and deep gas reservoirs. If technology to economically produce these supplemental supplies is not developed, then oil imports will increase even more than is currently projected.



Despite this acknowledged demand for oil and gas, the DOE research and development budget continues to address only a small fraction of present and future demand for energy resources. The 1987 DOE budget request provides less than 1 percent of its total funds for research projects associated with oil and gas, while 1985 consumption of oil and gas was over 60 percent of total U.S. energy consumption, and 2010 consumption will be approximately 50 percent. The proposed budget for programs under the DOE Office of Energy Research is over $1.8 billion with only $15 million allocated to geosciences, i.e., less than 1 percent. Within the geosciences program, half of the funds are for nuclear waste storage and isolation studies.

DOE OFFICE OF ENERGY RESEARCH BUDGET
($ Millions)

	FY 1986 Appropriations	FY 1987 Budget Request
High-Energy and Nuclear Physics	$ 661.4	$ 773.4
Fusion	365.4	333.0
Basic Energy Sciences*	433.8	441.4
Biological and Environmental	186.3	196.5
Advisory Assessment and Support	68.1	82.5
Total	$1,715.0	$1,826.8

*Geosciences budget for FY 1986 is $13.6 million of the $433.8 million allocated to basic energy sciences. The FY 1987 budget request for geosciences is $15.4 million within the $441.4 million basic energy sciences budget request.

A viable, cost-effective, long-term research program in the high risk areas of geosciences devoted to understanding the basic geology and chemistry associated with oil and gas discovery and production is essential as part of a balanced energy research program. Developing our own domestic resources rather than exporting jobs and increasing the trade deficit by increasing imports is sound national energy policy.

A relatively small redirection of $35 million into the geosciences research program in DOE would yield enormous benefits for the nation, would directly respond to the projected future energy demand, and would help the U.S. avoid over reliance on imported oil to meet future energy demand.

GEOSCIENTIFIC RESEARCH POTENTIAL

At present there are 30 billion barrels of proved recoverable oil reserves in the U.S., or just about six years supply at current consumption levels. Another 80 billion barrels of oil have yet to be discovered and are thought to exist in subtle geological traps (stratigraphic, paleomorphologic, paleogeographic, etc.) The identification of and production from these traps offer the possibility of extending our crude oil reserves many times and of stopping the decline in domestic production. Examples of giant stratigraphic traps include two of the largest fields in North America--East Texas and Prudhoe Bay. Each was wildcatted only because of some structural features which indicated potential, not because of an understanding of the nature of the reserves.

For each barrel produced in the U.S., two will be left in the ground using conventional production techniques. An appropriate geosciences program to improve enhanced oil recovery techniques to recover more of the remaining oil should be a national priority.

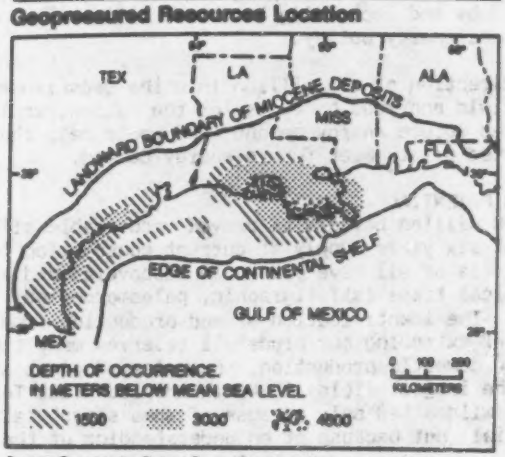
The potential for increased domestic production from supplemental natural gas resources is so huge that if successfully developed, abundant supplies of natural gas would be available for the next 100 years. However, there is so little actual knowledge or understanding of the geochemistry and geophysics of these resources that a major federal effort is required if the potential is to be realized.

GRI is proposing a redirection of $35 million within the budget for DOE's Office of Energy Research Programs (FY 1987 budget request of $1.82 billion) to establish a viable program in geosciences related to deep source gas, methane hydrates, geopressured gas, and related generic reservoir phenomena technology.

Geopressured zone methane is one of the major long-range options that could have large potential impacts on the supply of natural gas after the year 2000. These geopressured zones are located along the U.S. Gulf Coast and are sedimentary deposits containing trapped water and gas at higher-than-normal (hydrostatic) pressure.

Recent estimates of ultimately recoverable gas through advanced understanding of these reservoirs and production techniques developed by research vary from 50 Tcf to 1200 Tcf. The potential quantities of gas are extremely large, and this clearly merits an aggressive research program.

Geopressured Resources Location



Source: Report to the Federal Energy Regulatory Commission by the Supply-Technical Advisory Task Force on Nonconventional Natural Gas Resources, March 1978.

Methane hydrates are cages of ice with molecules of natural gas trapped inside. In 1981 the drilling vessel Glomar Challenger operating off the coast of Guatemala for the National Science Foundation discovered methane hydrate deposits in the sub-seafloor. Hydrates have also been discovered beneath the permafrost regions of Alaska's North Slope. Even potentially more important, seismic reflections from widely separated regions of the world's oceans indicate a "frozen zone" exists in many of the seafloor sediments, possibly containing methane hydrates.

To better define this resource and estimate its potential, research is required on sonic techniques and instrumentation necessary to identify hydrates through characteristic sound patterns. Research is also needed on better techniques to determine the electrical resistivity patterns (salty hydrate formations are better electrical conductors than the surrounding unfrozen salt water) to help identify and locate the hydrates. New extraction technologies are required to melt the hydrates or separate the gas from the ice formations. Estimates of the gas contained in hydrates just along the U.S. continental shelf range up to 200 Tcf.

Theoretical Methane Hydrates Location

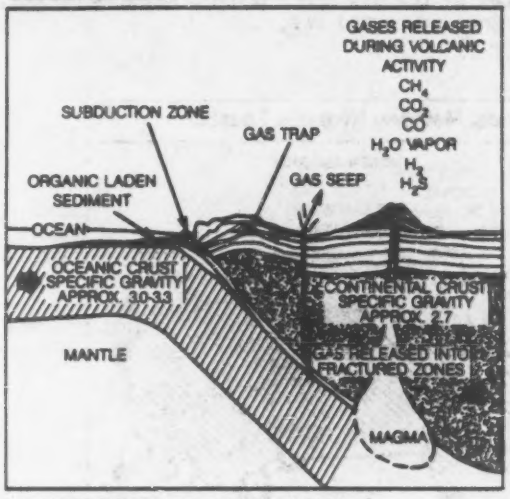
Source: DOE/FE-0046, "Unconventional Natural Gas"

Deep source gas. Several theories exist concerning the occurrence of deep sources of natural gas. Two major sources hypothesized by scientists are abiogenic and subducted.

Abiogenic gas derives its name from speculation that it was formed by non-organic means; that is, it did not come from the decaying of organic matter. Instead, it was formed deep in the earth's mantle during the creation of the earth, and through the ages it slowly seeped to shallower depths.

Subducted gas is thought to be of organic origin, but instead of being formed from layers of compacted sediments, the gas is created when marine organisms and vegetation are pushed deep into the earth by the tectonic movement of the earth's crust. The subducted gas theory would indicate possible locations of rich traps of natural gas 20,000 to 30,000 feet underground.

Subducted Gas



Source: DOE/FE-0046, "Unconventional Natural Gas"

These theories remain controversial and a great deal of very basic scientific research remains to be done to resolve the origin of deep source gas. More importantly, understanding the migration routes of this gas could lead to completely new exploration techniques. It could also add several hundred trillion cubic feet of natural gas resources.

CONCLUSION

It is quite apparent that the world and U.S. energy future over at least a fifty-year time frame, and probably much longer, will depend a great deal more on our understanding of geology, geophysics, and geochemistry than on high-energy and nuclear physics and fusion energy. Basic geosciences research meeting DOE's current guidelines for federal support would greatly enhance our nation's ability to recover abundant domestic oil and gas. Therefore, DOE should start reordering its priorities without impairing those ongoing

activities that are important elements in the nation's energy security by establishing a viable geosciences research program. Clearly, it is time for the Department of Energy's Basic Energy Sciences program to readjust its orientation in line with scientific, technical resources, and commercial realities as they relate to the energy future. The lack of a significant geosciences initiative seems to be totally out of balance with the strategic, technical, and scientific importance of this area. In FY 1987 the small DOE geoscience effort ($15.35 million) emphasizes geological isolation of nuclear waste, geochemistry related to the disposition of energy-related chemical waste, and scientific drilling in areas with high heat flow and hydrogeothermal energy potential. Although the strategic objectives of the DOE geosciences program cover areas of potentially greater interest, the total budget is too small to make meaningful progress and must be refocused to place top priority on critical issues of origin, occurrence, and recovery of hydrocarbons.

A $35 million redirection to provide an FY 1987 DOE geosciences budget of $50 million is the minimum funding required to establish a viable geosciences research effort in DOE's Office of Energy Research. Even this expanded program is less than 3 percent of the total budget proposed by DOE for programs under the OER.

RECOMMENDED REDIRECTION OF 1987 DOE OFFICE OF ENERGY RESEARCH PROGRAMS
GRI recommends the following FY 1987 redirection for geosciences:

Geopressured Resources	$10.0 Million
Methane Hydrates	7.0 Million
Deep Source Gas	6.0 Million
Abiogenic Gas	
Subducted Gas	
Geochemistry/Geomechanics	12.0 Million
TOTAL	$35.0 Million

Funding Recommendations

INSOFAR AS SPECIFICALLY GAS-RELATED GEOSCIENCE PROGRAMS ARE CONCERNED, GRI RECOMMENDS THAT DOE CONSIDER GREATER INVOLVEMENT IN THE FOLLOWING AREAS:

GEOPRESSURED ZONE METHANE
- PHYSICAL/CHEMICAL CHARACTERISTICS OF CONTAINED WATER
- UNDERSTANDING DEEP GAS MIGRATION IN DEEP BRINE FORMATIONS
- TECHNICAL/ENVIRONMENTAL ASPECTS OF BRINE MANAGEMENT
- TECHNOLOGY TO MAXIMIZE METHANE RECOVERY

DEEP GAS
- GEOCHEMICAL/THERMODYNAMIC ASPECTS OF DEEP GAS MIGRATION
- TECHNIQUES FOR DEEP GAS DETECTION
- MODELING MODES OF DEEP GAS ENTRAPMENT

METHANE HYDRATES
- EVALUATION OF RESOURCE POTENTIAL
- IDENTIFICATION OF STRUCTURE GEOCHEMISTRY, ETC.
- CONCEPTUALIZATION OF ECONOMIC RECOVERY TECHNIQUES

GEOCHEMISTRY/GEOMECHANICS
- THERMODYNAMICS OF ROCK-FLUID SYSTEMS
- ROCK FRACTURING/IN-SITU TECTONIC STRESSES
- POROSITY, PERMEABILITY, AND DISPERSIVITY OF ROCKS
- HYDROCARBON MATURATION
- CHEMICAL PROSPECTING

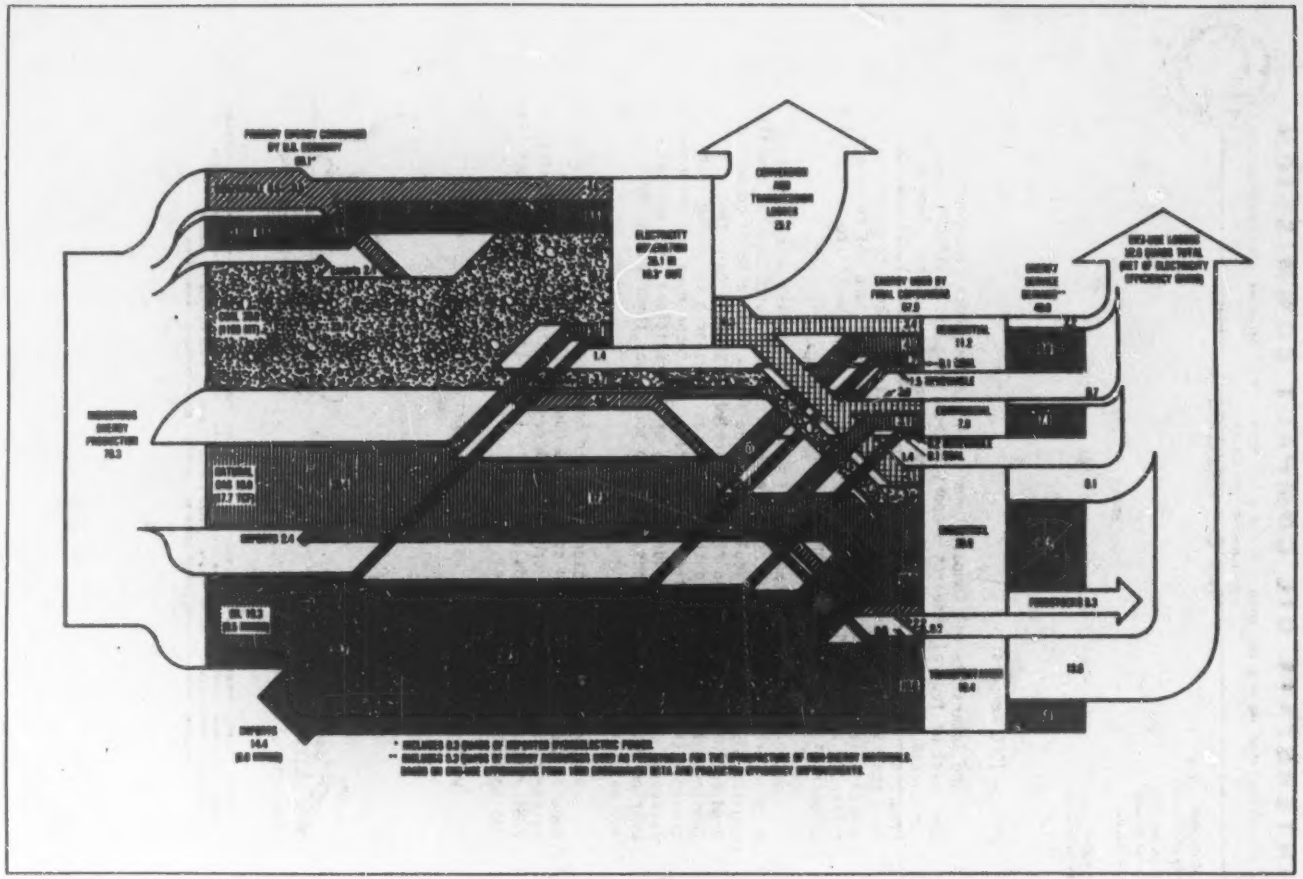


Figure VI-2. Projected U.S. Energy Sources and Uses in 1995 (NEPP-5 Reference Case)
(quadrillion Btu's)

INTERSTATE OIL COMPACT COMMISSION

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TELEPHONE: (405) 525-3556

Address Reply to Headquarters Office

GEORGE NIGH
Governor of Oklahoma

MARK WHITE
Governor of Texas
Joint Chairmen

W. TIMOTHY POWD
Executive Director

December 9, 1985

Fellow IOCC Members:

The Interstate Oil Compact Commission has long been concerned with the level of federal research support devoted to geoscientific issues associated with the discovery and production of oil and gas. From a 1985 Department of Energy research and development budget of $1,859,600,000, less than $13 million was spent on geoscientific research to enhance oil and gas discovery and production. In comparison, oil and gas resources currently satisfy 60% of U.S. energy needs and are expected to satisfy 50% or more of those needs through the year 2010.

We are all aware of the new oil and gas discoveries which must be made in order to avoid over-reliance on foreign oil supplies. We are also cognizant of just how difficult it will be in the future to discover and produce the new hydrocarbon resources needed, without significant new knowledge and technology in the geosciences. Research targeting such areas as the investigation of subtle traps, new techniques for enhanced recovery, advances in the understanding of nontraditional oil and gas bearing geological formations, and deep source gas theories can help us address these needs.

Passage of the resolution now under consideration will not only demonstrate the oil and gas community's concern for adequate federal research support, but also urges fiscal responsibility through a critical redirection of federal funds (ultimately $50 million per year) rather than adding to the federal budget.

We hope you will join us in this effort.

Mark White
Governor of Texas

George Nigh
Governor of Oklahoma

MEMBER STATES: ALABAMA • ALASKA • ARIZONA • ARKANSAS • CALIFORNIA • COLORADO • FLORIDA • ILLINOIS • INDIANA • KANSAS • KENTUCKY
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OKLAHOMA • PENNSYLVANIA • SOUTH DAKOTA • TEXAS • UTAH • VIRGINIA • WEST VIRGINIA • WYOMING
ASSOCIATES: GEORGIA • IDAHO • NORTH CAROLINA • OREGON • SOUTH CAROLINA • WASHINGTON

RESOLUTION
BEFORE THE CONVENTION OF THE
INTERSTATE OIL COMPACT COMMISSION

WHEREAS, The United States is predicted to rely upon oil and natural gas to satisfy approximately 50 percent of its energy demand for the next 25 years, and

WHEREAS, Whatever United States demand for oil cannot be satisfied by domestic production will, in the short-term, be satisfied by imported supplies of oil, and

WHEREAS, Relatively expensive supplemental supplies of natural gas could also be subject to competition from imported oil, thereby leading to even greater dependence on the oil supplies of foreign nations, and

WHEREAS, United States hydrocarbon resources could be used to fill this future demand and thereby reduce the reliance on imported oil, and

WHEREAS, The potential domestic production of oil from non-traditional geologic formations, such as subtle traps, plus the potential additional production from domestic resources if adequate technology for enhanced oil recovery could be developed, could be over 500 billion barrels, and

WHEREAS, Many hundreds of trillion of cubic feet of gas could be recovered from such non-traditional reserves of gas as geopressured reservoirs along the United States Gulf coast, methane hydrates along the Continental Shelf off the North American coast, and from formations much deeper than state of the art drilling technology can reach, and

WHEREAS, The Department of Energy energy R&D budget is seriously imbalanced since it allows only 8.4 percent of its funds for all research projects associated with oil and gas, while 1985 consumption of oil and gas will be over 60 percent of total U.S. energy consumption, and 2010 consumption will be approximately 50 percent,

THEREFORE, The Interstate Oil Compact Commission urges the Department of Energy to promote the use of domestic resources of oil and natural gas to satisfy future demand and at the same time, to correct the severe imbalance between funding priorities in the energy R&D budget and projected United States demand for energy, by shifting sufficient funds within its planned budget to eventually provide for an adequate program in research of geoscientific issues associated with the discovery of oil and gas, amounting to approximately $50 million per year; such a newly established effort would (1) advance the state of the art in these technologies, and (2) through funding at leading universities and other institutions in the field, assure the availability of well-trained professionals in the geoscientific field which will be needed by our country to satisfy the demand for oil and gas, to the maximum extent practicable, from domestic resources.

Introduced by Senator
Roy Sadler (OK)

Policy Statement of the Southwest Regional Energy Council

Regarding Enhanced Oil Recovery

Background.

The Southwest Regional Energy Council supports the development of technology and public policy faborable to produce as much of the domestic resources of crude oil as possible, including the estimated 300 billion barrels of already discovered oil which cannot be recovered under present technology and existing policies and economics.

Or. Key to unlocking this vast domestic resource is enhanced oil recovery (EOR), that is , a development and evolution of tertiary processes which would result in substantial reserve additions, economic activity and improved state revenues.

The Interstate Oil Compact Commission has undertaken a national study as well as state-by-state specific studies to assist in the development of EOR and effectively increase U.S. production, being undertaken initially by the states of Oklahoma and New Mexico with the cooperation of the U.S. Department of Energy and the National Institute for Petroleum and Energy Research.

Action.

The Southwest Regional Energy Council encourages other producing states to join in this national effort and participate in the development of this critical project.

Introduced by Senator
Roy Sadler (OK)

Policy Statement of the Southwest Regional Energy Council

Regarding National Energy Research

Background.

The United States is predicted to rely upon oil and natural gas to satisfy approximately fifty percent of its' energy demand for the next 25 years. years. Currently, the United States demand for oil is not being satisfied by domestic production alone, but is substantially dependent upon imported supplies.

United States hydrocarbon resources could be utilized to fill future demand, thereby reducing the reliance on imported oil and concurrently stimulating domestic economic activity. New technology and favorable public policy could stimulate domestic production from non-traditional geologic formations and promote enhanced oil recovery from an estimated 500 billion barrel reserve.

The U.S. department of Energy Research and Development Budget in recent years has been seriously inbalanced. Less than ten percent of available funds for all energy research projects has been allocated to oil and natural gas projects. A comparison of the budgeted amounts shows that:

•	Oil research	$30.303 million	1.42 percent
•	Natural gas	$134.947 million	6.32 percent
•	Coal	$353.589 million	16.58 percent
•	Nuclear	$992.615 million	46.56 percent
•	Other	$620.453 million	29.10 percent

Action.

The Southwest Regional Energy Council urges the U.S. Department of Energy to promote the use of domestic resources of oil and natural gas to satisfy future demand. Further, the Southwest Regional Energy Council urges the Department of Energy to correct the severe imbalance between funding priorities in the its energy Research and Development budget and the projected United States demand for energy, by shifting sufficient funds within its planned budget to eventually provide for an adequate program in oil and gas research. This must be accomplished by reallocating funds already committed and not by increased federal spending. A properly balanced research and development budget would advance the state-of-the-art in these technologies and, through funding at leading universities and other qualified facilities in the field, assure the availability of well-trained professionals in the geoscientific field which will be needed by our country to satisfy the demand for oil and gas, to the maximum extent practicable, from domestic resources.

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TESTIMONY FOR HOUSE SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

HOUSE COMMITTEE ON APPROPRIATIONS

April 9, 1986

BIOFUELS ENERGY SYSTEMS

D. J. O'Neil, PhD and H. O. Spauschus, PhD
Energy and Materials Sciences Laboratory
Georgia Tech Research Institute
Georgia Institute of Technology
Atlanta, Georgia 30332

The Georgia Institute of Technology,an established leader in bioenergy and biomass conversion research, since well before the 1970 oil crises is intimately involved with virtually every aspect of modern biomass technology development (alcohol fuels, pyrolysis, gasification, anaerobic digestion, etc.) with private industry, university and government laboratories, and with the international community.

GIT views with great concern the continued erosion of federal funding for USDOE's Biofuels Energy Systems. It views the proposed FY'87 level of $12.2M, a reduction from a previous low in FY'86 of $27.3M, to be indefensible. It effectively represents a cessation of any serious attempt to meet future energy requirements from an abundant renewable resource, one which already contributes substantially to national energy demands.

GIT urges that the proposed budget be rejected and endorses a return to a funding level which, as a minimum, equates with FY'86 levels, a level which it considers to be already reflective of and responsive to the national economic constraints.

It is the firm belief of the Georgia Institute of Technology that the reduction of the USDOE biofuels energy systems budget to a proposed 12.2M for FY'87 will:

(1) decimate the already-depleted university research programs

(2) isolate "research" activities in one or two national laboratories.

(3) dismantle and disperse core teams of veteran biomass researchers and technologists

(4) eliminate the training and education of students in

preparation for an emerging technology and industry

(5) drive committed U.S. researchers and industrial technology to seek foreign research and commercial development support

(6) surrender previously-funded market and technology leads to foreign competitors

(7) prevent the development of a viable U.S. biomass and bioenergy industry now or in the future

GIT urges not only an increase in research funds but also a redistribution in research fund allocations to redress the serious deficiency in support of university-based research, a general condition cited in the December 1985 report of the Solar Panel of the Energy Research Advisory Board (ERAB) to USDOE (Report DOE/S-0039).

As a specific example of the disproportionate cutbacks in university R & D support, from a FY'86 budget line item of $11,500,000 apparently for "thermochemical conversion" research, as of this month only a reported $2,400,000 will manage to trickle down for support of biomass thermochemical conversion research by universities and national laboratory researchers.

The ERAB Solar Panel states;

> "Reasonable diversity in laboratory participation in research, along with continuation or even increases in the base of university and industry research activities, must be maintained ---"

To meet that recommendation for biofuels energy research, funding will have to be maintained, university participation will

have to be more directly managed from one central coordinating source, large money-gobbling demonstration projects will have to be deferred or conducted, as effectively shown, through Regional Biomass Programs and their cost-sharing approaches.

We concur with another recent Energy Research Advisory Board (DOE/S-0046, 12/85) that USDOE's civilian R & D programs, which include both basic sciences and energy technology, are long-term investments which must be protected and supported to provide the Nation with the ability to deal with an uncertain energy future. As the report states;

> "--- essentially all projections of future of energy markets, including those of DOE, indicate that by the year 2000 there will be substantial increases in petroleum imports and significant real escalation in prices".

"Goal-directed programs", which have consistently beep able to achieve DOE-specified research evaluation criteria such as development of entrained pyrolysis oil production for petroleum substitution, "must be keep immune from short-term swings in oil supply and demand."

Finally, GIT in harmony with its mission to contribute to the economic development of the nation, and its demonstrated ability to nurture biomass research through commercialization by the private sector, endorses a policy of participation by industry in the transfer of government-supported technology to that sector. However, this same experience leads us to exhort the government to recognize that emerging industries, like emerging technologies, will require strong government funded support in the early stages.

TESTIMONY FOR HOUSE SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

HOUSE COMMITTEE ON APPROPRIATIONS

April 9, 1986

SOLAR THERMAL TECHNOLOGY

D. J. O'Neil, PhD and H. O. Spauschus, PhD
Energy and Materials Sciences Laboratory
Georgia Tech Research Institute
Georgia Institute of Technology
Atlanta, Georgia 30332

It is the firm belief of the Georgia Institute of Technology that a further erosion of the USDOE solar thermal budget from an average $30M for the last two years to a proposed $15.3M for FY'87 will:

(1) decimate the already-depleted university research programs

(2) isolate "research" activities in one center (SERI) and "engineering" development activities in only one other center (SANDIA, Albuquerque)

(3) dismantle and disperse core teams of veteran solar researchers and technologists

(4) eliminate the training and education of students in preparation for an emerging technology and industry

(5) drive committed U.S. researchers and industrial technology to seek foreign research and commercial development support

(6) surrender previously-funded market and technology leads to foreign competitors.

59-750 O—86——22

In 1971, long before the first mideast oil embargo, Georgia Tech researchers became the first U.S. scientific team to conduct experiments at the world's largest solar furnace. By 1977, the Advanced Components Test Facility was built on our campus and has been continually operated on behalf of the U.S. Department of Energy. We have been intimately involved at all stages of the development of solar thermal technology with private industry, university and government laboratories as well as with an international community. We have seen the development of solar thermal technology rapidly climb towards the system - level targets for the mid-to-late 1990's of $0.5/k Whe (electricity) and $9/MBtu (Heat). In addition to Solar Thermal Power Industry, a new cadre of companies, much more broadly based and drawn from aerospace (including space commercialization interests), advanced materials, and the specialty chemical industry, are beginning to be attracted by the prospects of solar-unique products and processes using solar thermal technology. To reduce research funding at this stage is to eliminate this new, emerging industrial interest.

Georgia Tech urges the continuation of funding at current levels of approximately $30M and adherence to a consistent multi-year research plan as outlined in the September, 1985 plan of the USDOE Solar Thermal Technology Division. We particularly endorse the following recommendation of the "Report of the Solar Panel of the Energy Research Advisory Board to the United States Department of Energy, December, 1985 (DOE/S-0039):

"Reasonable diversity in laboratory participation in research, along with continuation or even increases in the base of university and industry research activities, must be maintained to provide adequate opportunity for collaboration, competition, creativity and technology transfer and yet assure an efficient and effective use of limited resources.

STATEMENT OF THE HONORABLE SID MORRISON

TESTIMONY BEFORE THE HOUSE APPROPRIATIONS COMMITTEE
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT
April 9, 1986

Thank you Mr. Chairman for this opportunity to submit my views on the Department of Energy's 1987 budget request. I'd like to focus on two areas; the proposed sale of the Bonneville Power Administration and the nuclear fission research and development budget request.

Mr. Chairman, your work and the work of the Subcommittee members in the energy arena is greatly appreciated. We have been team players and will continue to be. However, it is only fair that I point out to you two items in the President's budget proposal that are economic and political dynamite for us in the Northwest: the proposals to defederalize the BPA and to adjust BPA's repayment to the Treasury.

Each region of the country has natural resource advantages that lead to lower local prices for transportation, coal, natural gas, oil, etc. In many cases, the federal government has made a significant investment to help areas take advantage of their given opportunities. The St. Lawrence Seaway, the Mississippi River System, and the Tennessee Valley Authority are good examples.

In the Northwest, the one great federal investment in natural resources was the harnessing of energy from the falling waters in the Columbia and Snake Rivers. This was not just a matter of advancing the money to build a series of dams, but of arranging an international treaty with Canada to provide the water. The agreements with the U.S. government are complex. Each dam that was built carries a different repayment schedule and most facilities also pay interest.

Yes, electricity costs less in the Northwest, but that is because we had a vast renewable energy source to be harnessed. The federal government has used this resource in the national interest. One-third of the nation's aluminum is produced in the area. Private companies were enticed there during World War II with the assurance of massive quantities of energy at reasonable rates. Nuclear materials that ended World War II were produced with Northwest power. And local ratepayers are paying for the whole thing! I can't think of another area of the U.S. where this same story can be told.

There are many more arguments that can be made as to why the BPA should be allowed to continue to pay its half a billion dollar annual commitment to the federal Treasury and why existing contracts should be honored by both sides. The point is that I cannot support the sale of the BPA when it ultimately means a tax increase for the fragile Northwest region, an area that has yet to experience economic recovery.

I am also concerned about the Administration's request for nuclear fission R&D. In looking at the DOE's budget request, I see the U.S. headed down two paths. The first leads us toward an expansion of defense related

activities. For example, funding for space and defense power systems rose from $20.2 million in FY86 to a request of $71.7 million in FY87.

The second path leads us away from research in advanced reactor concepts. For example, the High Temperature Gas-Cooled Reactor FY87 funding request is down more than 80 percent from FY86. In addition, the advanced breeder reactor technology account is cut almost 50 percent.

I wonder if these two paths are heading in the same direction? Will they even cross at any point so that research can be shared? I support research into defense and space power sources, but I am concerned that this funding increase is masking an ever dwindling civilian budget. The Congress must ensure that our civilian R&D budget is meeting future civilian nuclear energy needs as well as addressing our defense and space related needs. The mission is to make sure the two arenas compliment one another rather than substitute for one another.

There are several programs in my District which I would like to bring to the attention of the Appropriations Committee. The first is the Fast Flux Test Facility located at the Hanford Engineering Development Laboratory in Richland, Washington. The primary mission of FFTF is to test full-size nuclear fuels and components typical of those found in a commercial liquid metal reactor, with the goal of dramatically extending fuel life. The FFTF budget has been substantially reduced over the past few years. Funding in FY85 was $104.5 million and in FY86, $86.3 million. The Administration's budget request for FY87 is $70.6 million.

This funding level is not adequate to allow normal FFTF operations, maintain fuel supply on schedule and preserve a technology component for the advanced reactor program. A funding level of $79.6 million could ensure the continued operation of the FFTF, a facility which not only maintains a presence in development of the breeder reactor, but is also crucial in testing and development of the evolving space nuclear reactor. Even at this funding level FFTF spending will be cut over ten percent from FY86.

The Subcommittee may also be interested to know that three Washington State municipal corporations, Benton County Public Utility District, Franklin County Public Utility District and the City of Richland, have submitted a proposal to the U.S. Department of Energy for the development of a plan to <u>privately</u> finance, design, construct, and operate an electrical generation facility (Hanford Cogeneration Project) using waste heat from the FFTF.

The sponsoring utilities would finance, own and operate the power addition at no cost to the federal government. The partially-built Clinch River steam generators would be used for the project. The completion costs would be paid by the utilities. Thus, DOE would achieve significant research and development value from the substantial government investment that has already been made in these components. Other potential cost savings include an offset of the FFTF operating costs through a payment to

DOE for energy and a substantial reduction of FFTF's annual power costs to operate the dump heat exchangers.

In my view, this country cannot afford to jeopardize its energy future by allowing research facilities, such as the FFTF, to slowly stagnate and eventually die simply because the illusion of adequate energy renders us too short-sighted to plan for tomorrow.

I would also like to mention the Nuclear Waste Treatment Program at Battelle's Pacific Northwest Laboratory. This program is aimed at developing and testing technologies for immobilizing nuclear wastes and has produced a liquid-fed ceramic melter that just began operations in December of 1984. The DOE has invested $16 million in this program and yet is willing to terminate it before the final research has been completed. The program was funded at $4.2 million in FY86 but is zeroed out in the Administration's FY87 request.

The NWTP is international in scope, with Germany and Japan having contributed $4 million in 1985. In addition, this technology center provides a resource of expertise for DOE's Savannah River, Hanford and West Valley defense wastes as well as commercial wastes. Funding of $5 million would allow PNL to answer vital questions of the vitrification of radioactive wastes.

Finally, I'd like to reiterate my support for food irradiation. Regulations have just been given final approval allowing irradiation treatment of fresh fruits and vegetables. I have been a long time champion of this process and believe the $5 million made available in FY86 planted a seed that has grown and is creating great interest in the program. I know, for instance, that there is considerable interest in Congressman Wes Watkins' district as well as in Iowa, Hawaii, Florida and my own state of Washington.

The goal of this program is to establish six regional projects for process development in the irradiation of agricultural commodities by 1989 with a phase-out of DOE participation by 1992. With the interest shown by most of the states involved, it would be unfortuante to halt the program in its infancy. In my view, the ultimate pay-off will far exceed this investment. The Energy Research and Production Subcommittee agrees with this assessment and has authorized $5 million for the program in FY87.

I appreciate the opportunity to submit my views to the subcommittee and look forward to working with you in the energy arena.

Mr. MYERS. The committee stands in adjournment until 10 o'clock tomorrow morning.

THURSDAY, APRIL 10, 1986.

KENTUCKY PROJECTS

WITNESSES

HON. WILLIAM NATCHER, KENTUCKY, AND MEMBERS OF KENTUCKY DELEGATION

HON. ROMANO L. MAZZOLI

HON. GENE SNYDER

HON. HAL ROGERS

HON. CARROLL HUBBARD, JR.

Mr. BEVILL. The committee will come to order. We are also pleased to have our good friends, Congressman Natcher and Congressman Mazzoli, appear before us, and the Chair now will recognize the most distinguished member of the United States Congress, Mr. Natcher.

Mr. NATCHER. Mr. Chairman, thank you very much, and I want you and the members of your subcommittee to know we appreciate the opportunity to appear at this time, on behalf of the Kentucky Projects.

All down through the years, Mr. Chairman, you and the members of your subcommittee have been good to us, and we appreciate it.

When we can justify our projects, when the benefit cost is right, and we can justify them, you have approved them, and it has meant a great deal to the Commonwealth of Kentucky.

Speaking not only for myself but for our other members in the House, and for our two Senators, Mr. Chairman, it is a pleasure to be here.

With your permission, Mr. Chairman, I would like to file at this point in the record a statement and also obtain permission from you to file a statement from Senator Ford, which will be placed in the record at the point that you desire.

Mr. BEVILL. Without objection, it is so ordered.

[The statement of Hon. William H. Natcher follows:]

STATEMENT
OF
REPRESENTATIVE WILLIAM H. NATCHER
BEFORE THE
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT
OF THE
COMMITTEE ON APPROPRIATIONS
OF THE
HOUSE OF REPRESENTATIVES

MR. CHAIRMAN, AGAIN, WE WANT YOU TO KNOW THAT WE APPRECIATE THE OPPORTUNITY TO APPEAR AT THIS TIME ON BEHALF OF THE PROJECTS IN KENTUCKY. WITH THE EXCEPTION OF ONE OF OUR STATES, KENTUCKY HAS MORE MILES OF NAVIGABLE STREAMS THAN ANY OTHER STATE IN THIS COUNTRY. DOWN THROUGH THE YEARS, WE HAVE SUFFERED DAMAGES FROM FLOODS AND LOSS OF LIFE. YOU AND THE MEMBERS OF THIS COMMITTEE HAVE ALWAYS BEEN GOOD TO US AND IN EACH AND EVERY INSTANCE WHEN WE COULD JUSTIFY OUR PROJECTS AND THE BENEFIT COST RATIO WAS RIGHT, THEY HAVE BEEN APPROVED.

MR. CHAIRMAN, YOU AND THE MEMBERS OF YOUR COMMITTEE HAVE BEEN GOOD, NOT ONLY TO KENTUCKY, BUT TO ALL OF OUR STATES WHICH HAVE PROJECTS THAT WHEN PRESENTED WERE JUSTIFIED FROM THE STANDPOINT OF BENEFIT COST RATIO. WE HAVE ATTEMPTED DOWN THROUGH THE YEARS, TO PRESENT TO YOU PROJECTS WHICH WE COULD JUSTIFY AND WITH YOUR HELP, HAVE SUCCEEDED IN BRINGING ABOUT A GOOD WATER RESOURCE DEVELOPMENT PROGRAM IN THE STATE OF KENTUCKY.

IN THE SECOND CONGRESSIONAL DISTRICT AND IN THE SECTION OF KENTUCKY THAT I REPRESENT, WE HAVE COMPLETED AND HAVE IN OPERATION NOW FIVE RESERVOIRS--ROUGH RIVER, NOLIN RIVER, BARREN RIVER, GREEN RIVER AND TAYLORSVILLE LAKE. ALL OF THESE PROJECTS HAVE PRODUCED MANY BENEFITS FOR OUR PEOPLE AND ESPECIALLY DURING THE PAST TWO YEARS WHEN WE HAVE SUFFERED MILLIONS AND MILLIONS OF DOLLARS IN DAMAGES AS A RESULT OF FLOOD CONDITIONS.

I WANT TO JOIN WITH MY COLLEAGUES, NOT ONLY IN KENTUCKY, BUT IN THE OTHER STATES WHO ARE INTERESTED IN THE TVA PROPOSAL NOW BEFORE THE COMMITTEE AND ALSO THE PROPOSAL CONCERNING THE LAND BETWEEN THE LAKES IN KENTUCKY. I DO HOPE THAT THE REQUEST CONCERNING A SEVERE REDUCTION OR DELETION IN THESE FUNDS IS TURNED DOWN BY YOUR COMMITTEE.

MR. CHAIRMAN, I DISTINCTLY RECALL BACK SOME 30 YEARS AGO WHEN WE WERE MAKING EVERY EFFORT TO BUILD THE TENNESSEE VALLEY AUTHORITY SYSTEM IN ORDER TO PRODUCE MORE BENEFITS FOR OUR PEOPLE. EVERY EFFORT WAS MADE TO INCREASE THE AUTHORITY AND TERRITORY OF THIS AUTHORITY AND CERTAINLY NO EFFORT WAS MADE TO REDUCE THE OPERATION TO THE EXTENT THAT OUR PEOPLE IN THIS SECTION OF THE UNITED STATES WOULD SUFFER.

MR. CHAIRMAN, AS YOU KNOW, SOME $830,000 HAS BEEN EXPENDED FOR THE CAMPGROUND LAKE PROJECT IN MY DISTRICT, BUT SO FAR, THE COMMONWEALTH OF KENTUCKY HAS FAILED TO JOIN WITH THE CORPS OF ENGINEERS ON THIS PROJECT. THERE IS NOTHING FURTHER THAT YOU AND THE MEMBERS OF YOUR COMMITTEE CAN DO AT THIS TIME ON THIS PROJECT, BUT I DO HOPE THAT THE NEXT TIME I APPEAR, WE WILL BE IN A POSITION TO REQUEST ADDITIONAL FUNDING FOR THE CAMPGROUND LAKE PROJECT.

I JOIN WITH ALL OF MY COLLEAGUES FROM KENTUCKY IN THE HOUSE AND IN THE SENATE IN THEIR REQUESTS FOR OUR STATE AND THEIR DISTRICTS.

MR. CHAIRMAN, I WANT TO JOIN WITH YOU AND THE MEMBERS OF YOUR COMMITTEE IN ALL MATTERS PERTAINING TO THE OHIO RIVER. CERTAINLY, THIS IS NOT THE TIME TO REDUCE OPERATION AND MAINTENANCE COSTS TO THE EXTENT THAT AT SOME TIME IN THE FUTURE WE WILL BE FORCED TO APPROPRIATE CONSIDERABLY MORE MONEY TO BRING THE LEVEL BACK IN LINE AS A RESULT OF REDUCTIONS NOW BEFORE THE COMMITTEE.

AGAIN, I WANT YOU TO KNOW THAT I APPRECIATE THE OPPORTUNITY TO APPEAR AND I WANT TO THANK YOU AND THE MEMBERS OF YOUR COMMITTEE FOR THE SUPPORT AND ASSISTANCE WE HAVE ALWAYS RECEIVED DOWN THROUGH THE YEARS.

# # # # # # # # # # #

Mr. NATCHER. Mr. Chairman, it is a distinct honor and privilege now for me to present to you our friend and colleague from the Third District, Ron Mazzoli.

Mr. MAZZOLI. Thank you very much. I would like to reiterate what you said about our friends from Alabama and Indiana, and other members of the distinguished subcommittee.

It has been my pleasure to serve in Congress for 16 years, and I think I have joined Chairman Natcher on each of these annual pilgrimages. In all these years, I think that you have never let us down where we could justify the project.

Mr. Chairman, I have a short statement which I would ask permission to be made part of the record.

Mr. BEVILL. Without objection.

Mr. MAZZOLI. Today, I would like to testify on two very important projects in my congressional district, which encompasses Louisville and much of Jefferson County, Kentucky, on which I have worked closely with my distinguished colleague, Congressman Gene Snyder: the Southwest Jefferson County Flood Protection Project and the Falls of the Ohio.

The Southwest Jefferson County Flood Protection Project consists of a series of earth levees, concrete floodways and pumping plants and is engineered to protect nearly 60,000 residents, two industrial sites and several hundred commercial units in the area from the flooding which occurs on almost an annual basis.

Mr. Chairman, 65 percent of the $60 million total Federal project cost has already been appropriated by the Congress, and the project is 59 percent physically complete.

The full $7.5 million recommended by the Administration for Fiscal Year 1987 is essential for timely completion of this project—set for the end of Fiscal Year 1989.

In addition, Mr. Chairman, I would like to express my support for an appropriation to carry out legislation to protect the Falls of the Ohio.

The Falls of the Ohio is the formal name for the former rapids near the McAlpine Dam on the Ohio River in Jefferson County, Kentucky, and bordering on Floyd and Clark Counties, Indiana.

The Falls of the Ohio is the only place where the Ohio River flows over bare bedrock and is a world-renowned, 300 million-year-old fossilized coral reef.

Since 1966 the Falls has been a National Natural Landmark, indicating the significance of the area to geologists in the past 100 years.

Also attracted to the area because of the Falls is an unusual array of wildlife.

But, over the years the coral reef has been vandalized by souvenir hunters, and sections of the surrounding banks have been turned into dumping sites.

Last Congress, the President signed into law an authorization of some $1.04 million for the establishment of the Falls of the Ohio National Wildlife Conservation Area.

Some $300,000 of this has already been appropriated and the planning phases of the project have been completed.

I commend the initiative of my distinguished colleague in the House, Gene Snyder, in spearheading this vital legislation to protect and preserve the Falls.

The need for preserving the area is greater now than ever before. Further deterioration will take place if we do not take steps now to preserve the Falls for our own enjoyment and that of future generations.

In sum, Mr. Chairman, these two vital projects, in my judgment, merit continued support from your distinguished subcommittee, and I hope that you can recommend full funding for both.

I thank you, again, Mr. Chairman and your able subcommittee, for allowing me the opportunity to speak for these two important projects.

Mr. BEVILL. Very good.

[The statement of Hon. Romano L. Mazzoli follows:]

STATEMENT
OF
CONGRESSMAN ROMANO L. MAZZOLI
BEFORE THE
APPROPRIATIONS SUBCOMMITTEE ON ENERGY
AND WATER DEVELOPMENT
U. S. HOUSE OF REPRESENTATIVES
WASHINGTON, D. C.

APRIL 10, 1986

MR. CHAIRMAN AND DISTINGUISHED MEMBERS OF THE SUBCOMMITTEE:

I THANK YOU FOR HAVING ACCEPTED OVER THE YEARS THE PETITIONS FROM THE KENTUCKY DELEGATION IN SUPPORT OF ENERGY AND WATER DEVELOPMENT PROJECTS IN THE COMMONWEALTH.

I EXTEND SPECIAL THANKS TO MY DISTINGUISHED COLLEAGUE, CONGRESSMAN BILL NATCHER, FOR HAVING ARRANGED THIS APPEARANCE BY THE KENTUCKY DELEGATION.

TODAY, I WOULD LIKE TO TESTIFY ON TWO VERY IMPORTANT PROJECTS IN MY CONGRESSIONAL DISTRICT, WHICH ENCOMPASSES LOUISVILLE AND MUCH OF JEFFERSON COUNTY, KENTUCKY, ON WHICH I HAVE WORKED CLOSELY WITH MY DISTINGUISHED COLLEAGUE, CONGRESSMAN GENE SNYDER: THE SOUTHWEST JEFFERSON COUNTY FLOOD PROTECTION PROJECT AND THE FALLS OF THE OHIO.

THE SOUTHWEST JEFFERSON COUNTY FLOOD PROTECTION PROJECT CONSISTS OF A SERIES OF EARTH LEVEES, CONCRETE FLOODWAYS AND PUMPING PLANTS AND IS ENGINEERED TO PROTECT NEARLY 60,000 RESIDENTS, TWO INDUSTRIAL SITES AND SEVERAL HUNDRED COMMERCIAL UNITS IN THE AREA FROM THE FLOODING WHICH OCCURS ON ALMOST AN ANNUAL BASIS.

OVER THE LAST 100 YEARS, RESIDENTS IN THE AREA OF JEFFERSON COUNTY IN THE SOUTHWEST HAVE BEEN VICTIMIZED BY OHIO RIVER FLOODS AT LEAST 75 TIMES. THE WORST FLOOD RECORDED IN THE AREA WAS IN 1937 AND IT HAS BEEN ESTIMATED THAT SHOULD A FLOOD OF THAT MAGNITUDE RECUR NOW, DAMAGES TO THE COMMUNITY WOULD RUN AN ESTIMATED $295 MILLION (COMPARED TO THE TOTAL FEDERAL-LOCAL SHARED COST OF THE FLOOD CONTROL PROJECT OF $70 MILLION OVER 14 YEARS).

MR. CHAIRMAN, LOCAL AUTHORITIES HAVE ALREADY COMMITTED OVER $9 MILLION FOR THIS PROJECT AND HAVE AGREED TO OPERATE AND MAINTAIN IT UPON COMPLETION AT A COST OF $117,000 A YEAR. THIS, I BELIEVE, DEMONSTRATES A STRONG LOCAL COMMITMENT FOR THE PROGRAM.

AND, THE UNANIMOUS ENDORSEMENT THIS PROJECT HAS RECEIVED OVER THE YEARS FROM OUR DELEGATION IN THE CONGRESS IS, I THINK, A FURTHER DEMONSTRATION OF THE COMMITMENT AND THE WORTHINESS OF THIS PROJECT.

MR. CHAIRMAN, 65% OF THE $60 MILLION TOTAL FEDERAL PROJECT COST HAS ALREADY BEEN APPROPRIATED BY THE CONGRESS AND THE PROJECT IS 59% PHYSICALLY COMPLETE. THE FULL $7.5 MILLION RECOMMENDED BY THE ADMINISTRATION FOR FISCAL YEAR 1987 IS ESSENTIAL FOR TIMELY COMPLETION OF THIS PROJECT -- SET FOR THE END OF FISCAL YEAR 1989.

IN ADDITION, MR. CHAIRMAN, I WOULD LIKE TO EXPRESS MY SUPPORT FOR AN APPROPRIATION TO CARRY OUT LEGISLATION TO PROTECT THE FALLS OF THE OHIO.

THE FALLS OF THE OHIO IS THE FORMAL NAME FOR THE FORMER RAPIDS NEAR THE McALPINE DAME ON THE OHIO RIVER IN JEFFERSON COUNTY, KENTUCKY, AND BORDERING ON FLOYD AND CLARK COUNTIES, INDIANA.

THE FALLS OF THE OHIO IS THE ONLY PLACE WHERE THE OHIO RIVER FLOWS OVER BARE BEDROCK AND IS A WORLD-RENOWN, 300 MILLION YEAR-OLD FOSSILIZED CORAL REEF. SINCE 1966 THE FALLS HAS BEEN A NATIONAL NATURAL LANDMARK, INDICATING THE SIGNIFICANCE OF THE AREA TO GEOLOGISTS IN THE PAST 100 YEARS. ALSO ATTRACTED TO THE AREA BECAUSE OF THE FALLS IS AN UNUSUAL ARRAY OF WILDLIFE.

DUT, OVER THE YEARS THE CORAL REEF HAS BEEN VANDALIZED BY SOUVENIR HUNTERS, AND SECTIONS OF THE SURROUNDING BANKS HAVE BEEN TURNED INTO DUMPING SITES.

LAST CONGRESS, THE PRESIDENT SIGNED INTO LAW AN AUTHORIZATION OF SOME $1.00 MILLION FOR THE ESTABLISHMENT OF THE FALLS OF THE OHIO NATIONAL WILDLIFE CONSERVATION AREA. SOME $300,000 OF THIS HAS ALREADY BEEN APPROPRIATED AND THE PLANNING PHASES OF THE PROJECT HAVE BEEN COMPLETED. I COMMEND THE INITIATIVE OF MY DISTINGUISHED COLLEAGUE IN THE HOUSE, GENE SNYDER, IN SPEARHEADING THIS VITAL LEGISLATION TO PROTECT AND PRESERVE THE FALLS.

THE NEED FOR PRESERVING THE AREA IS GREATER NOW THAN EVER BEFORE. FURTHER DETERIORATION WILL TAKE PLACE IF WE DO NOT TAKE STEPS NOW TO PRESERVE THE FALLS FOR OUR OWN ENJOYMENT AND THAT OF FUTURE GENERATIONS.

IN SUM, MR. CHAIRMAN, THESE TWO VITAL PROJECTS, IN MY JUDGMENT, MERIT CONTINUED SUPPORT FROM YOUR DISTINGUISHED SUBCOMMITTEE AND I HOPE THAT YOU CAN RECOMMEND FULL FUNDING FOR BOTH.

I THANK YOU, AGAIN, MR. CHAIRMAN AND YOUR ABLE SUBCOMMITTEE, FOR ALLOWING ME THE OPPORTUNITY TO SPEAK FOR THESE TWO IMPORTANT PROJECTS.

Mr. NATCHER. Mr. Chairman, our next witness to appear is our friend and colleague from the Fourth District of Kentucky, Gene Snyder.

This probably will be Mr. Snyder's last appearance, Mr. Chairman, before you and your subcommittee on behalf of the annual meeting on Kentucky Projects.

I want you to know that in Kentucky we tell all of the people that Gene Snyder has been good for the State of Kentucky and especially as the ranking minority member on the Committee on Public Works. I have seen him tested, Mr. Chairman, the same as you and I used to see them tested when Mike Kirwin was here, and Mike Kirwin used to say he tested well.

I have seen bills come out pertaining to this committee and pertaining to the Subcommittee on Public Works Appropriations, and Gene Snyder always marches right down the road with you, Mr. Chairman.

It is a pleasure for me to present him to you.

Mr. BEVILL. Mr. Natcher, I would like to echo just what you have said, because Gene Snyder has not only served Kentucky well, he has served the nation well, particularly Walker County, Alabama.

I have tested him myself. I had a project that I would never have gotten without the help of Gene Snyder, and I will always be grateful to you for that very important project.

Mr. MYERS. I certainly want to concur and congratulate the Kentucky Delegation for the cost effectiveness, the working together, along with the other body.

I wish I had that support in the other body regardless of which party.

The Senate in the other body, they fight everything that is good for Indiana. I talked to both of you about a project that our two Senators took out. I learned by the newspapers. I didn't know it otherwise.

You people do work together. That is the reason Kentucky has done so well and the reason Indiana hasn't done so well in the basketball court, as well.

Mr. MAZZOLI. We weren't going to say it.

Mr. MYERS. I congratulate you. You did a great job. We were pulling after Indiana went out. Of course, the next closest school was Louisville.

Mr. MAZZOLI. We are proud.

Mr. MYERS. Be sure to get that on the record. Louisville Cardinals.

But, Gene, we are going to miss you here. Bill, I am going to have to take exception. I think we are going to see Gene Snyder back, not maybe sitting as a member of Congress, of course, but he will be back because you can't afford not to bring him back with his experience before this committee, and the authorizing committee.

As you say, the courage he has had through the years, Kentucky can't afford to lose this kind of valuable experience and assets you have, and we completely agree.

This subcommittee has worked with his subcommittee, and we have worked very closely with the full committee, and it has

always been a pleasure to work and cooperate together, and he has been a great asset for Kentucky.

But it is always a loss for the nation to lose this experience. I am sure we are going to see him back again.

Mr. BEVILL. We will be expecting you back here next year.

Mr. MYERS. Just wearing a different hat.

Mr. SNYDER. Am I recognized?

Mr. BEVILL. Now we are going to let you talk.

Mr. SNYDER. First let me say I appreciate all the kind comments. If we could have gotten those three or four months ago, I might have filed. I am reminded of Westbrook Pegler. You may remember him. He was one of the most caustic writers that ever put a pen to paper.

They quit using him in most papers, because they were getting sued for libel. He talked in one of his articles about Mrs. Roosevelt's funeral and how large the throng that came to Hyde Park and the great eulogies that were spoken there.

He ended with that caustic remark, "Few came to mourn and many came to be certain." I trust after those fine remarks that the last comment won't be applied me.

Mr. Chairman and distinguished members of the committee, I came in, of course, as my friend Romano Mazzoli was testifying, and he has covered the basic issues that I wanted to cover, and you have my prepared statement.

I would like to elaborate just a little bit on the Falls of the Ohio.

As you will recall, on December 29, 1981, the President signed into law a bill creating the Falls of the Ohio National Wildlife Conservation Area.

This unique area contains fossils estimated to be in excess of 900 million years old which are found in the United States only at the Falls of the Ohio.

In addition, this area provides a habitat for over 250 varieties of waterfowl and shore birds.

The legislation authorizing the creation of this wildlife conservation area tasks the Secretary of the Army, acting through the Chief of Engineers, with the implementation and management of the area.

This was due to the fact that the Corps already manages most of the land surrounding the conservation area because of its duties associated with the management of McAlpine Locks and Dam.

While most of the land is under Federal control, some acquisition is necessary. Consequently, the original legislation authorized $300,000 for planning and acquisition and your committee appropriated that amount.

Since then it has been determined that additional funds will be needed, and in 1984 Congress enacted the Atlantic Striped Bass Conservation Act (P.L. 98-613) which contained a provision raising the authorization for this project in Fiscal Year 1987 to $1.04 million.

Last year, your subcommittee did provide for this project in your version of the supplemental appropriation bill—which I appreciated—but it was lost in conference because the authorization was for Fiscal 1987.

I discussed with your chairman the possibility of using reprogramming to provide the necessary funds, but again, because of the 1987 authorization date, we were unable to proceed on that route.

Now that we are talking about appropriations for Fiscal 1987, this authorization date should not cause any problems.

I would be most appreciative if you could give this project the additional $740,000 we need to complete it. It is a small price to pay to protect a unique area.

The other major project now under way in the Fourth District, of course, is the Southwest Jefferson County Floodwall.

It is a system of earth levees, concrete floodwalls, pumping plants and related items designed to protect 32 square miles of flood plain—some 24,100 acres in Jefferson County, Kentucky.

Development in the area is currently valued at over 1.5 billion dollars ($1.576 billion at 1985 values).

To date, $42.5 million have been allocated. Seven and a half million dollars have been requested this year for continuation of the construction.

It is a valuable project—the annual benefits are estimated to be in the neighborhood of $8.4 million. The remaining benefit—remaining cost ratio is 10.9 to 1.

It is a good project and is moving along well.

One other issue that I would like to call to the attention of the subcommittee is Section 507 of H.R. 6, the Water Resources Conservation, Development and Infrastructure Improvement and Rehabilitation Act of 1985.

This section establishes a streambank erosion prevention and control demonstration program on the Ohio River and its tributaries in an effort to develop the most cost efficient measures to halt the serious erosion problems that afflict the shorelines of so much of our nation's waterway network.

My district, the 4th District of Kentucky, is bordered by the Ohio River—about 120 miles of it—so I am familiar on a first hand basis with the drastic need for a program like this.

I would like to thank the Chairman and the Members of this Subcommittee for your favorable treatment of the Southwest Jefferson County Floodwall and the Falls of the Ohio Wildlife Conservation Area in the past.

And as always, I thank you for your time today and urge you to give equally favorable consideration to these projects again this year.

Mr. BEVILL. Thank you.

[The statement of Hon. Gene Snyder follows:]

STATEMENT OF GENE SNYDER
MEMBER OF CONGRESS
FOURTH DISTRICT, KENTUCKY
APPROPRIATIONS - SUBCOMMITTEE
ON ENERGY & WATER DEVELOPMENT

April 10, 1986

Mr. Chairman; Distinguished Members of the Subcommittee; I am pleased to once again join my Colleagues from Kentucky in front of you to direct your attention to the projects which mean so much to the citizens we represent.

As always, I appreciate your making this time available to us.

FALLS OF THE OHIO

As you will recall, on December 29, 1981, the President signed into law a Bill creating the Falls of the Ohio National Wildlife Conservation Area. This unique area contains fossils estimated to be in excess of 900 million years old which are found in the United States only at the Falls of the Ohio. In addition, this area provides a habitat for over 250 varieties of waterfowl and shore birds.

The legislation authorizing the creation of this wildlife conservation area tasks the Secretary of the Army, acting through the Chief of Engineers, with the implementation and management of the area. This was due to the fact that the Corps already manages most of the land surrounding the conservation area because of its duties associated with the management of McAlpine Locks and Dam.

While most of the land is under Federal control, some acquisition is necessary. Consequently, the original legislation authorized $300,000 for planning and acquisition and your Committee appropriated that amount. Since then it has been determined that additional funds will be needed and in 1984 Congress enacted the Atlantic Striped Bass Conservation Act (P.L. 98-613) which contained a provision raising the authorization for this project in fiscal year 1987 to $1.04 million.

Last year, your Subcommittee did provide for this project in your version of the supplemental appropriation bill -- which I appreciated -- but it was lost in Conference because the authorization was for Fiscal 1987. I discussed with your Chairman the possibility of using reprogramming to provide the necessary funds, but again because of the 1987 authorization date, we were unable to proceed on that route.

Now, that we are talking about appropriations for Fiscal 1987, this authorization date should not cause any problems.

I would be most appreciative if you could give this project and the additional $740,000 we need to complete it your favorable consideration. It's a small price to pay to protect a unique area.

SOUTHWESTERN JEFFERSON COUNTY FLOODWALL

The other major project now under way in the Fourth District, of course, is the Southwestern Jefferson County Floodwall. It is a system of earth levees, concrete floodwalls, pumping plants and related items designed to protect 32 square miles of flood plain -- some 24,100 acres in Jefferson County, Kentucky. Development in the area is currently valued at almost 1 1/2 billion dollars ($1.576 billion at 1985 values).

To date, $42.5 million dollars have been allocated. Seven and a half million dollars have been requested this year for continuation of the construction in Fiscal 1984.

It is a valuable project -- the annual benefits are estimated to be in the neighborhood of $8.4 million dollars. The remaining benefit -- remaining cost ratio is 10.9 to 1.

It's a good project and is moving along well.

One other issue that I would like to call to the attention of the Subcommittee is Section 507 of H.R. 6, the Water Resources Conservation, Development and Infrastructure Improvement and Rehabilitation Act of 1985. This section establishes a streambank erosion prevention and control demonstration program on the Ohio River and its tributaries in an effort to develop the most cost efficient measures to halt the serious erosion problems that afflict the shorelines of so much of our nation's waterway network. My District, the 4th District of Kentucky, is bordered by the Ohio River -- about 120 miles of it -- so I am familiar on a first hand basis with the drastic need for a program like this.

As a Kentuckian, I'm very proud of my State and I would like to share the natural beauty of Kentucky with the rest of the nation, but sharing it with the downriver States through streambank erosion is not the way to do it.

I do hope you will keep section 507 in mind and subject to authorization, I hope you will provide funds, somewhere in the neighborhood of 5 million dollars, to initiate these demonstration projects as soon as possible.

I would like to thank the Chairman and the Members of this Subcommittee for your favorable treatment of the Southwestern Jefferson County Floodwall and the Falls of the Ohio Wildlife Conservation Area in the past.

And as always, I thank you for your time today and urge you to give equally favorable consideration to these projects again this year.

Mr. NATCHER. Our next witness to appear is our friend and colleague from the Fifth District of Kentucky, Hal Rogers.

Mr. BEVILL. We are also glad to hear from our good friend and colleague, Congressman Rogers.

Mr. ROGERS. Thank you, Mr. Chairman, and I thank my colleague, Mr. Natcher.

Mr. Chairman, thank you for the opportunity to testify this morning.

I would like to discuss just one project with you this morning: the 202 project, which includes the Levisa and Tug forks of the Big Sandy River, and in my district, the Upper Cumberland River.

We are facing some serious problems with this project, and I would like to ask the subcommittee's help in solving them.

With the Chairman's permission, I would then like to submit my detailed statement for the record.

As the Chairman knows, for several years I have been battling with the Corps about this project. First we battled over whether they were going to build the project at all. Then once we convinced them to go ahead with construction, we battled over the level of flood protection they were going to provide.

They were attempting to reduce the scope from the Standard Project Flood level of protection, which is enough to protect against the highest flood likely in the region, to just providing enough protection to cover the level of flood that we had back in 1977.

Fortunately, thanks to the help of the Chairman and the ranking minority member of this subcommittee, we have succeeded in keeping this project on track.

Nevertheless, these problems are recurring in the current budget submission.

The budget request for the portion of the 202 project located in my district is short by $4.7 million. Important as the dollar level of this shortfall is, it is even more important to realize that this shortfall represents another attempt by the Corps to reduce the scope and continue delays in the construction of this essential project.

Of this shortfall, the first $1.1 million can be attributed to Barbourville, Kentucky. This $1.1 million is the money needed to begin construction of the second phase of Barbourville's flood protection—raising the levee to the SPF level of protection.

Without this levee work, the project will be incomplete, limited to the existing cut-through. What this means is that the Corps is attempting once again to reduce the scope of the project from SPF down to the flood of 1977 level of protection.

Back in 1982, language was included in the Supplemental Appropriations Bill requiring the construction of SPF protection for the 202 project.

In the Fiscal Year 1985 Energy and Water Appropriations Act, the subcommittee included specific statutory language requiring construction at the SPF level in Barbourville. It appears that the Corps is again attempting to circumvent those clear instructions.

The second portion of the shortfall is in the Harlan, Kentucky portion of the 202 project. The request is $3.6 million short there, the amount representing the Corps capability for detailed design and construction work in that area.

The failure to request these funds has life-threatening implications in Harlan. I find the delay this would cause in construction absolutely outrageous in view of the fact that Harlan is in the most dangerous situation of any community along the Upper Cumberland River.

Since they are located right at the headwaters, the waters can rise with devastating speed, and there is not enough warning time to evacuate homes in the event of flooding.

During 1977, Harlan suffered the most severe flooding of any community along the Upper Cumberland, with $31 million worth of damage, four people killed, and 2,000 people left homeless.

And I would like to point out that it is often the poorest people in this region who are hurt, since they are the ones who can't afford to move their homes out of the floodplains.

Harlan still hasn't recovered from the flood of 1977. And with floods recurring every seven to nine years, every year that we delay in construction means forcing Harlan close to the brink of another disaster—a disaster that this region simply cannot afford.

Harlan is struggling for its economic development and the next devastating flood will lock it into a stranglehold which will choke off its hopes of development for years to come.

For these reasons, I would like to ask the subcommittee for the following. I would like to ask that you restore the $4.7 million to the Corps budget for construction of phase two in Barbourville and for advanced design and construction work in Harlan.

I would like you also to include language requiring the structural work to be at the SPF level and requiring the Corps to proceed without further delays.

Finally, I would like to alert the Chairman to a problem that is beginning to appear on the horizon. As the Chairman knows, the other body has passed a water resources authorization bill which would have the effect of requiring cost sharing on separable segments of existing flood control projects.

This is entirely different from the provisions in the House-passed bill.

If this Senate provision is signed into law, it would be the death knell for flood protection along the Upper Cumberland River.

The median income in Knox County is only $10,000, and in Harlan it is $13,000—compared to a nationwide median family income of nearly $20,000. Twenty-two percent of our families live below the poverty line and the unemployment rate in Harlan is 17 percent—nearly triple the national average.

Mr. Chairman, there is no way under the sun for such a community to afford the price tag for cost-sharing—but neither can they afford to live without flood protection.

I am now working closely with the authorizing committee to address this situation in conference. But should these efforts fail, I would greatly appreciate any assistance the subcommittee could provide in terms of waiving these cost-sharing requirements for the 202 project.

Once again, I thank the chairman for all the help he has given me in the past and ask your assistance in these essential matters, and I will submit the remainder of my testimony for the record.

Thank you.

[The statement of Hal Rogers follows:]

TESTIMONY SUBMITTED BY

THE HONORABLE HAL ROGERS

BEFORE THE

SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

APRIL 10, 1986

MR. CHAIRMAN, THANK YOU FOR THE OPPORTUNITY TO TESTIFY THIS MORNING.

I WOULD LIKE TO DISCUSS JUST ONE PROJECT WITH YOU THIS MORNING: THE 202 PROJECT, WHICH INCLUDES THE LEVISA AND TUG FORKS OF THE BIG SANDY RIVER, AND IN MY DISTRICT, THE UPPER CUMBERLAND RIVER. WE'RE FACING SOME SERIOUS PROBLEMS WITH THIS PROJECT AND I'D LIKE TO ASK THE SUBCOMMITTEE'S HELP IN SOLVING THEM. WITH THE CHAIRMAN'S PERMISSION, I WOULD THEN LIKE TO SUBMIT MY DETAILED STATEMENT FOR THE RECORD.

AS THE CHAIRMAN KNOWS, FOR SEVERAL YEARS I'VE BEEN BATTLING WITH THE CORPS ABOUT THIS PROJECT. FIRST WE BATTLED OVER WHETHER THEY WERE GOING TO BUILD THE PROJECT AT ALL. THEN ONCE WE CONVINCED THEM TO GO AHEAD WITH CONSTRUCTION, WE BATTLED OVER THE LEVEL OF FLOOD PROTECTION THEY WERE GOING TO PROVIDE. THEY WERE ATTEMPTING TO REDUCE THE SCOPE FROM THE STANDARD PROJECT FLOOD LEVEL OF PROTECTION, WHICH IS ENOUGH TO PROTECT AGAINST THE HIGHEST FLOOD LIKELY IN THAT REGION, TO JUST PROVIDING ENOUGH PROTECTION TO COVER THE LEVEL OF FLOOD THAT WE HAD BACK IN 1977. FORTUNATELY, THANKS TO THE HELP OF THE CHAIRMAN AND RANKING MINORITY MEMBER OF THIS SUBCOMMITTEE, WE HAVE SUCCEEDED IN KEEPING THIS PROJECT ON TRACK.

NEVERTHELESS, THESE PROBLEMS ARE RECURRING IN THE CURRENT BUDGET SUBMISSION.

THE BUDGET REQUEST FOR THE PORTION OF THE 202 PROJECT LOCATED IN MY DISTRICT IS SHORT BY $4.7 MILLION. IMPORTANT AS THE DOLLAR LEVEL OF THIS SHORTFALL IS, IT IS EVEN MORE IMPORTANT TO REALIZE THAT THIS SHORTFALL REPRESENTS ANOTHER ATTEMPT BY THE CORPS TO

REDUCE THE SCOPE AND CONTINUE DELAYS IN THE CONSTRUCTION OF THIS ESSENTIAL PROJECT.

OF THIS SHORTFALL, THE FIRST $1.1 MILLION CAN BE ATTRIBUTED TO BARBOURVILLE, KENTUCKY. THIS $1.1 MILLION IS THE MONEY NEEDED TO BEGIN CONSTRUCTION OF THE SECOND PHASE OF BARBOURVILLE'S FLOOD PROTECTION--RAISING THE LEVEE TO THE SPF LEVEL OF PROTECTION. WITHOUT THIS LEVEE WORK, THE PROJECT WILL BE INCOMPLETE, LIMITED TO THE EXISTING CUT-THROUGH. WHAT THIS MEANS IS THAT THE CORPS IS ATTEMPTING ONCE AGAIN TO REDUCE THE SCOPE OF THE PROJECT FROM SPF DOWN TO THE FLOOD OF '77 LEVEL OF PROTECTION.

BACK IN 1982, LANGUAGE WAS INCLUDED IN THE SUPPLEMENTAL APPROPRIATIONS BILL REQUIRING THE CONSTRUCTION OF SPF PROTECTION FOR THE 202 PROJECT. IN THE FY85 ENERGY AND WATER APPROPRIATIONS ACT, THE SUBCOMMITTEE INCLUDED SPECIFIC STATUTORY LANGUAGE REQUIRING CONSTRUCTION AT THE SPF LEVEL IN BARBOURVILLE. IT APPEARS THAT THE CORPS IS AGAIN ATTEMPTING TO CIRCUMVENT THOSE CLEAR INSTRUCTIONS.

THE SECOND PORTION OF THE SHORTFALL IS IN THE HARLAN, KENTUCKY PORTION OF THE 202 PROJECT. THE REQUEST IS $3.6 MILLION SHORT THERE, THE AMOUNT REPRESENTING THE CORPS CAPABILITY FOR DETAILED DESIGN AND CONSTRUCTION WORK IN THAT AREA.

THE FAILURE TO REQUEST THESE FUNDS HAS LIFE-THREATENING IMPLICATIONS IN HARLAN. I FIND THE DELAY THIS WOULD CAUSE IN CONSTRUCTION ABSOLUTELY OUTRAGEOUS IN VIEW OF THE FACT THAT HARLAN IS IN THE MOST DANGEROUS SITUATION OF ANY COMMUNITY ALONG THE UPPER CUMBERLAND RIVER. SINCE THEY'RE LOCATED RIGHT AT THE HEADWATERS, THE WATERS CAN RISE WITH DEVASTATING SPEED AND THERE'S

NOT ENOUGH WARNING TIME TO EVACUATE HOMES IN THE EVENT OF FLOODING.

DURING 1977, HARLAN SUFFERED THE MOST SEVERE FLOODING OF ANY COMMUNITY ALONG THE UPPER CUMBERLAND, WITH $31 MILLION WORTH OF DAMAGE, 4 PEOPLE KILLED AND 2000 PEOPLE LEFT HOMELESS. AND I'D LIKE TO POINT OUT THAT IT'S OFTEN THE POOREST PEOPLE IN THIS REGION WHO ARE HURT, SINCE THEY'RE THE ONES WHO CAN'T AFFORD TO MOVE THEIR HOMES OUT OF THE FLOODPLAINS.

HARLAN STILL HASN'T RECOVERED FROM THE FLOOD OF '77. AND WITH FLOODS RECURRING EVERY 7-9 YEARS, EVERY YEAR THAT WE DELAY IN CONSTRUCTION MEANS FORCING HARLAN CLOSER TO THE BRINK OF ANOTHER DISASTER--A DISASTER THAT THIS REGION SIMPLY CANNOT AFFORD. HARLAN IS STRUGGLING FOR ITS ECONOMIC DEVELOPMENT AND THE NEXT DEVASTATING FLOOD WILL LOCK IT INTO A STRANGLEHOLD WHICH WILL CHOKE OFF ITS HOPES OF DEVELOPMENT FOR YEARS TO COME.

FOR THESE REASONS, I'D LIKE TO ASK THE SUBCOMMITTEE FOR THE FOLLOWING. I'D LIKE TO ASK THAT YOU RESTORE THE $4.7 MILLION TO THE CORPS BUDGET FOR CONSTRUCTION OF PHASE TWO IN BARBOURVILLE AND FOR ADVANCED DESIGN AND CONSTRUCTION WORK IN HARLAN. I'D LIKE YOU ALSO TO INCLUDE LANGUAGE REQUIRING THE STRUCTURAL WORK TO BE AT THE SPF LEVEL AND REQUIRING THE CORPS TO PROCEED WITHOUT FURTHER DELAYS.

FINALLY, I'D LIKE TO ALERT THE CHAIRMAN TO A PROBLEM THAT IS BEGINNING TO APPEAR ON THE HORIZON. AS THE CHAIRMAN KNOWS, THE OTHER BODY HAS PASSED A WATER RESOURCES AUTHORIZATION BILL WHICH WOULD HAVE THE EFFECT OF REQUIRING COST SHARING ON SEPARABLE SEGMENTS OF EXISTING FLOOD CONTROL PROJECTS. THIS IS ENTIRELY DIFFERENT FROM THE PROVISIONS IN THE HOUSE-PASSED BILL.

IF THIS SENATE PROVISION IS SIGNED INTO LAW, IT WOULD BE THE DEATH KNOLL FOR FLOOD PROTECTION ALONG THE UPPER CUMBERLAND RIVER. THE MEDIAN INCOME IN KNOX COUNTY IS ONLY $10,000 AND IN HARLAN IT IS $13,000 -- COMPARED TO A NATIONWIDE MEDIAN FAMILY INCOME OF NEARLY $20,000. TWENTY-TWO PERCENT OF OUR FAMILIES LIE BELOW THE POVERTY LINE AND THE UNEMPLOYMENT RATE IN HARLAN IS 17%--NEARLY TRIPLE THE NATIONAL AVERAGE.

MR. CHAIRMAN, THERE IS NO WAY UNDER THE SUN FOR SUCH A COMMUNITY TO AFFORD THE PRICE TAG FOR COST-SHARING--BUT NEITHER CAN THEY AFFORD TO LIVE WITHOUT FLOOD PROTECTION.

I AM NOW WORKING CLOSELY WITH THE AUTHORIZING COMMITTEE TO ADDRESS THIS SITUATION IN CONFERENCE. BUT SHOULD THESE EFFORTS FAIL, I WOULD GREATLY APPRECIATE ANY ASSISTANCE THE SUBCOMMITTEE COULD PROVIDE IN TERMS OF WAIVING THESE COST-SHARING REQUIREMENTS FOR THE 202 PROJECT.

ONCE AGAIN, I THANK THE CHAIRMAN FOR ALL THE HELP HE'S GIVEN ME IN THE PAST AND ASK YOUR ASSISTANCE IN THESE ESSENTIAL MATTERS, AND I'LL SUBMIT THE REMAINDER OF MY TESTIMONY FOR THE RECORD.

BIG SOUTH FORK NATIONAL RIVER AND RECREATION AREA

THE NEXT PROJECT I'D LIKE TO BRING TO THE SUBCOMMITTEE'S ATTENTION IS THE BIG SOUTH FORK NATIONAL RIVER AND RECREATION AREA.

MR. CHAIRMAN, THE CONGRESS WILL HAVE TO MAKE MANY DIFFICULT BUDGET DECISIONS THIS YEAR. BUT I'D LIKE TO TELL YOU TODAY HOW ESSENTIAL THIS PROJECT IS TO MY DISTRICT AND OF THE IMMENSE PROMISE IT OFFERS US IN CREATING MORE JOBS, MORE BUSINESS AND MORE ECONOMIC DEVELOPMENT.

BSF IS A UNIQUE NATURAL WONDER. WITH ITS RIVER AND GORGE, IT COULD BECOME THE YELLOWSTONE OF THE EAST. WITH ITS COMBINATION OF WATERWAYS, MOUNTAINS AND FORESTS, ALONG WITH MANY RECREATIONAL OPPORTUNITIES, IT OFFERS A BROAD CHOICE OF VACATION POSSIBILITIES TO FAMILIES FROM NEARBY URBAN AREAS WHO MAY NOT BE ABLE TO AFFORD LONGER TRIPS TO DISTANT VACATION SPOTS.

BUT MR. CHAIRMAN, EXCITING AS THESE POSSIBLITIES ARE, THEY DON'T SHOW WHAT I SEE AS THE SPECIAL THRILL OF BIG SOUTH FORK.

BSF IS EXPECTED TO ATTRACT MORE THAN 1 MILLION VISITORS EACH YEAR TO MCCREARY, PULASKI AND WAYNE COUNTIES IN KENTUCKY, AS WELL AS TO THE NEIGHBORING COUNTIES IN TENNESSEE. THEY WILL NEED SERVICE STATIONS, RESTAURANTS, CAMPGROUNDS, SHOPS AND MOTELS--BUSINESSES AND SERVICES WHICH THE MEN AND WOMEN IN MY DISTRICT ARE WILLING AND ABLE TO PROVIDE.

THESE VISITORS WILL HAVE A SUBSTANTIAL AND BENEFICIAL IMPACT ON THE LOCAL ECONOMIES. WHEN THIS PROJECT BECOMES FULLY OPERATIONAL, IT IS ESTIMATED THAT THESE VISITORS WILL SPEND APPROXIMATELY $90 MILLION PER YEAR. SINCE IN 1978, THE TOTAL LODGING, RESTAURANT, AMUSEMENT AND RECREATION BASED REVENUE IN MCCREARY COUNTY TOTALED ONLY $956,000, THE POTENTIAL FOR ECONOMIC DEVELOPMENT AS A RESULT OF BIG SOUTH FORK IS

ABSOLUTELY ENORMOUS.

AND THESE ADDITIONAL REVENUES WILL MEAN JOBS. THESE ARE JOBS RIGHT AT HOME SO THE FOLKS IN MY DISTRICT WILL NOT HAVE TO LEAVE THEIR HOMES AND FAMILIES TO FIND WORK. THIS PROJECT IS EXPECTED TO BRING THIS AREA ABOUT 3500 NEW JOBS, JOBS WHICH WE BADLY NEED.

AND THE SPINOFF EFFECTS FROM THESE JOBS WILL CONTRIBUTE TO THE ECONOMIC DEVELOPMENT OF THESE COMMUNIITES. AND SINCE THEY HAVE LONG SUFFERED FROM CHRONIC UNEMPLOYMENT AND UNDERDEVELOPMENT, THESE BENEFITS ARE PARTICULARLY NEEDED.

THE CORPS HAS REQUESTED $9 MILLION FOR CONSTRUCTION AT BIG SOUTH FORK. THIS FUNDING WILL BE SPENT PRIMARILY AT THE BLUE HERON FACILITY IN KENTUCKY, WITH WORK ON CAMPGROUNDS AND ROADS. THIS FUNDING IS GREATLY NEEDED AND I WOULD URGE THE SUBCOMMITTEE'S SUPPORT FOR THE REQUESTED FUNDING LEVEL.

WOLF CREEK DAM

THE WOLF CREEK DAM CONSTITUTED THE FIRST PHASE OF THE CUMBERLAND LAKE PROJECT, BEGINNING IN 1950. THE DAM'S MAIN FUNCTION IS TO CONTROL FLOODING AND GENERATE HYDROELECTRIC POWER. IN ADDITION, THE LAKE OFFERS A FISHERMEN'S AND BOATERS' PARADISE, WITH BEAUTIFUL WATERS AND SURROUNDING MOUNTAINS.

THE CORPS' REQUEST IS FOR $3,132,000 IN O&M FUNDING. I URGE APPROVAL OF THIS AMOUNT.

LAUREL RIVER LAKE

LAUREL RIVER LAKE IS A WELCOME ADDITION TO EASTERN KENTUCKY'S TOURIST ATTRACTIONS. THE CORPS OPERATIONS ARE AN IMPORTANT COMPONENT OF LAUREL LAKE. THEIR REQUEST IS FOR $900,000 IN O&M FUNDING AND I URGE SUPPORT FOR THIS LEVEL.

MARTIN'S FORK LAKE

FINALLY, I WOULD LIKE TO STATE MY SUPPORT FOR THE $486,000 IN OPERATIONS AND MAINTENANCE FUNDS FOR THIS LAKE IN HARLAN COUNTY.

THIS LAKE IS IMPORTANT IN TWO RESPECTS. FIRST, IT HELPS TO REDUCE THE FLOOD ELEVATION ALONG THE UPPER CUMBERLAND RIVER. SECOND, IT OFFERS THE GREATLY APPRECIATED SIDE BENEFITS OF RECREATIONAL OPPORTUNITIES FOR LOCAL RESIDENTS.

I CERTAINLY URGE THE SUBCOMMITTEE TO ADOPT THE ADMINISTRATION'S REQUEST.

CONCLUSION

THE PROJECTS I HAVE OUTLINED INCLUDE A WIDE VARIETY OF PROJECTS, INCLUDING BOTH FLOOD CONTROL AND MAJOR TOURISM DEVELOPMENT. IN MOST CASES, THE CORPS' REQUEST IS ADEQUATE AND I SUPPORT THESE REQUESTS.

THE ONE EXCEPTION IS IN THE REQUEST FOR THE 202 PROJECT, AND IT IS THERE THAT I WOULD REQUEST AN ADDITIONAL $4.6 MILLION ABOVE THE CORPS' REQUEST TO PROVIDE FOR CONSTRUCTION OF PHASE TWO IN BARBOURVILLE, KENTUCKY AND FOR ADVANCED DESIGN AND CONSTRUCTION IN HARLAN.

ONCE, AGAIN, THANK YOU FOR YOUR ASSISTANCE.

Mr. BEVILL. Mr. Rogers, you have touched on some things that this appropriations subcommittee shares, and feels very strongly about those areas of our nation that need the flood control and water projects.

The worst are going to be denied that if the Senate provision prevails. We are very concerned about that, of course. As you know, we are not on the conference. We have no voice in it, just what you and I can do in talking to the members.

Mr. MYERS. We have a conferee here.

Mr. BEVILL. We have got a good man there that can help save us, but it is going to be a very critical thing—you need these flood control projects that are down in the areas where so many come under the poverty level.

Mr. ROGERS. They are people that can least afford local cost sharing.

Mr. BEVILL. They have the greatest need for protection, and so we share your views on that, and I hope all of us can prevail on the authorization subcommittee of the House and Senate when they go to conference—they expect to go to conference this week—make that point clear to them, because we share your concern.

And the only thing we could do, of course—if we put authorization in our proposing bill, that gets us in trouble, you know.

We get beat over the head; once in a while we do it. We win some and lose some. It is difficult sometimes to do that.

So, the best way would be if we can get it worked out and get the conferees to work it out at least to give us an escape hatch, so areas of the country that can't raise the money will not be denied flood protection. That is what it comes down to.

Mr. ROGERS. That is right, Mr. Chairman. The Harlan project over there, estimates are that Harlan would have to come up with $34 million for that project to be viable.

The whole tax roll is hardly that.

Mr. NATCHER. Our next witness is our friend and colleague from the First Congressional District, Carroll Hubbard.

Mr. HUBBARD. Thank you very much.

Mr. Chairman and members of the Subcommittee on Energy and Water Development, thank you for granting me this opportunity to comment on behalf of water projects in or directly affecting my First Congressional District of Kentucky. Let me also express my appreciation to my good friend and colleague from Kentucky's Second District, Congressman Bill Natcher, for arranging this opportunity for our Kentucky delegation to speak on behalf of our Kentucky water projects.

First, I would like to add my support to several items listed in the U.S. Army Corps of Engineers' Civil Works budget request for Fiscal Year 1987, as follows:

Three million, seven hundred and twenty-five thousand dollars for operation and maintenance of Barkley lock, dam, and powerplant on Lake Barkley, Kentucky. The dam has been a significant factor in reducing the frequency of flooding in the Cumberland Valley, which in turn lessens the flooding downstream on the lower Ohio and Mississippi Rivers. Barkley's powerplant has four units with a combined capacity sufficient to supply the needs of an average city of 226,000. The Barkley Lock handles average annual

traffic of about 6,000 vessels and 2 million tons of commerce. In addition, Lake Barkley has over 5.5 million visitors annually who enjoy its many recreational opportunities.

In view of the valuable contribution Lake Barkley facilities offer for my constituents, I recommend that funding for operation and maintenance of this project be approved.

One million, fifteen thousand dollars for operation and maintenance of the Green and Barren Rivers in Kentucky and Tennessee. The funds would be used for the basic operation of two locks and 109 miles of channel maintenance and repair.

Four hundred and eighty-six thousand dollars for Smithland Locks and Dam would be used to complete the project involving real estate administration, acquisition of recreation lands, and a recreational site. This project affects Illinois, Indiana, and Kentucky.

Thirty-five million, one hundred and three thousand dollars for operation and maintenance of the Ohio River Locks and Dams and the $4,657,000 funding request for open channel work on the Ohio River which affects Kentucky, Indiana, Illinois, Pennsylvania, West Virginia, and Ohio.

Four hundred and forty-five thousand dollars for operation and maintenance of Hickman Harbor, Kentucky. These funds would be used to maintain the harbor and the navigation channel for Hickman Harbor.

Two hundred thousand dollars for the Tradewater River Basin feasibility study for water resources development. The Tradewater River lies in Western Kentucky and is a tributary to the Ohio River extending approximately 110 miles through a 943 square mile drainage area. The purpose is for assistance in alleviating agricultural flood damages. Over the long term, the Tradewater River Mainstream experiences about $410,000 in damages annually. The Corps' Louisville District has essentially completed the 100 percent federally-funded reconnaissance study. The second stage of the study must be completed to result in a definite project report being forwarded that details a solution to this problem.

One million, seven hundred thousand dollars for rehabilitation construction work on Lock and Dam 53 and $1,500,000 for continuing planning and engineering studies involving Locks and Dams 52 and 53 which affect Illinois and Kentucky. Regarding the $1.5 million for planning and engineering studies, I understand that the commander of the Ohio River Division of the U.S. Corps of Engineers in Cincinnati, Brigadier General Peter J. Offringa, is submitting a request that this amount be increased to $2,500,000 to fully complete the studies involving the Olmstead Lock and Dam during Fiscal Year 1987.

I would appreciate the subcommittee's consideration for funding the full $2,500,000 for the planning and engineering studies.

In addition to these projects, I would like to add my support to the U.S. Corps of Engineer's request for $3,000,000 for the Barkley Dam Safety Assurance Project. This appropriations item has to do with the fact that Barkley Dam is approximately 70 miles from New Madrid, Missouri, which is the epicenter of the largest earthquakes that have ever occurred in the history of the United States. This area experienced two major earthquakes which reached an 8.0

magnitude on the richter scale back in 1811 and 1812. The Barkley Dam Safety Assurance Study was initiated in 1977 to evaluate the stability of the project's earth embankment which is approximately 7,116 feet long and has a railroad along its top.

The Corps and a panel of consultants have concluded that the foundation sands could liquify during a major earthquake and the slopes would fail. Preliminary evaluation indicates probable catastrophic loss of life and tremendous economic losses. I understand from the Corps of Engineers that this project continues to receive evaluation to develop a lower cost solution to provide a zone of resistance to failure.

Further, I would like to take this opportunity to add my support to all projects related to maintenance and improvement of the Ohio River, the Cumberland-Tennessee Rivers and all of the water projects which have been developed by the U.S. Army Corps of Engineers for the Commonwealth of Kentucky. All of the water resources in the area provide a vital link for commerce and tourism as well as for the general enrichment of the quality of life for residents and visitors.

Therefore, I am pleased to endorse the U.S. Army Corps of Engineers' proposed funding for all of Kentucky's water projects.

Thank you for your consideration of my comments and requests for funding for the projects to which I have referred.

Mr. BEVILL. All right.

Mr. NATCHER. I present to you at this time Senator Ford's statement which you were nice enough to permit us to file.

[The statement of Hon. Wendell H. Ford follows:]

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WENDELL H. FORD
KENTUCKY

COMMERCE, SCIENCE AND TRANSPORTATION
ENERGY AND NATURAL RESOURCES
RULES AND ADMINISTRATION

United States Senate
WASHINGTON, DC 20510

April 9, 1986

Dear Mr. Chairman:

Since my schedule does not permit me to appear before your hearing on April 10, I am writing in support of Kentucky's civil works projects for Fiscal Year 1987 and ask that my statement be included in the hearing record.

I would like to express my appreciation to the Subcommittee on Energy and Water Development of the House Committee on Appropriations for their continued interest in flood control and water resource development in Kentucky, and particularly wish to thank Congressman William Natcher for his role in promoting awareness of Kentucky's needs among his colleagues.

While I strongly support all requested Kentucky appropriations, I would like to single out for comment four areas of great concern to me that are not in the civil works budget request for FY87.

TENNESSEE VALLEY AUTHORITY

I would like to make a personal plea on behalf of the Tennessee Valley Authority. If TVA's budget as proposed by the Administration stands, the non-power programs would be reduced to $58 million, more than a 50% cut from last year. These programs have already sustained a 50% cut from their FY 1981 level. TVA is willing to do its share to help right the federal deficit, but fair is fair and a reduction of this magnitude is clearly not.

The Office of Management and Budget seems to base its opposition to TVA on the philosophical grounds that it is solely a regional development agency. As you well know, Mr. Chairman, this is simply not the case I would point out and underscore that only about 15% of TVA's current appropriations are for economic development. The preponderance goes into valuable research and demonstration projects on significant environmental and natural resource

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protection and enhancement problems that face every jurisdiction in the country.

Also targeted for extinction is Land Between the Lakes (LBL), the unique wilderness area in Kentucky and Tennessee which serves over two million visitors from across the nation every year, the same number of people who visit Yellowstone National Park. One of the largest Federal holdings east of the Mississippi, LBL is run in a manner that is different from any other in the country. Its lands, forest, water, wildlife, fish and facilities are managed to provide optimum benefits from seemingly conflicting purposes. There is farming at LBL and timber harvesting, wildlife restoration programs and hunting, environmental education for children and adults, cultural and historic preservation, interpretive trails and scientific research. All this is in addition to hiking, boating, fishing, backpacking and camping.

LBL is a national laboratory, a model of integrated resource management for evey state in the union of how a wilderness area -- or park -- can flourish with a small amount of funding and a great amount of enthusiasm and careful planning.

The need to cut the national deficit requires tough choices on every one's part, and all programs will have to give their share. TVA has already given that share, yet it continues to demonstrate a unique ability to apply its limited resources to issues that have wide applicability and significant national benefits. To further reduce its ability to carry out its mission would be counter to the best interests of the country. The TVA budget is a modest one and I strongly urge you to recommend a current services funding level that will allow TVA to continue its important work.

LOCKS AND DAMS 52 AND 53

Last year the Committees on Appropriations agreed to mark $500,000 for continued planning and engineering (CPE) for Locks and Dams 52 and 53. This sum was essential in order to avoid a delay in the design and eventual construction of the replacement facility at Olmsted, Illinois, and I am grateful to you.

This year the Corps has requested $1.5 million for CP&E for this critical structure, but I would respectfully suggest that the figure is too low and ask for an increase of $1 million. The new figure of $2.5 million would be used to advance the study schedule, real estate acquisition and construction by almost half a year.

The funds would serve to complete the model studies of the hydrological design of the structure and the design of the drum gates. They would also allow completion of the liquifaction and dynamic earthquake analyses in 1987 and advance the foundation investigations.

The information gained from these investigations will then be used to finalize the general design of the project and to complete the general design memorandum by September 1988. This, in turn, will allow the District to begin the feature designs months earlier, to begin real estate acqusition in 1989 and to start construction in 1991.

The enclosed letter from the head of the Ohio River Division office, General Peter J. Offringa, is proof that the Corps has the capability to use the additional $1 million. It is essential that work on the new structure at Olmsted proceed as rapidly as possible because it is in an area that is the hub of the inland waterway system. The waterborne traffic of 26 states passes through this region. River traffic on the Ohio River and its tributaries must transit this location on its way to and from the Mississippi River. In fact, 40% of all the traffic on the entire Ohio River system utilizes the aging Locks and Dams 52 and 53. Furthermore, the Corps has estimated that traffic will grow at these two facilities nearly 40% faster than on the inland navigation system as a whole.

Unfortunately, the existing locks are neither structurally sound, nor can they handle the projected levels of future traffic. Operation and maintenance of the 100-year old technology used on these 60-year old facilities is dangerous, time consuming and not at all cost-effective. It is estimated that $26.8 million will be needed over the next 50 years to keep Locks and Dams 52 and 53 functioning. Rather than spend money to maintain the status quo, lets move ahead quickly on the new.

SOUTH WILLIAMSON FLOODWALL

The South Williamson floodwall is a second project where the Corps could absorb more funding to reach its capability level, and I would ask for additional funding of $700,000 so that detailed work can be initiated and this critical project expedited.

Once approval is granted for the floodwall project, detailed engineering, design and real estate studies will be initiated. Feature Design Memoranda (FDM) will be prepared during FY87 for the floodwall project and for appurtenances protecting the community of South Williamson. The floodwall FDM will require detailed geotechnical explorations to evaluate foundation conditions. Alternative floodwall alignments and designs will be investigated to determine the best overall design from the standpoint of economy, safety,

dependability and environmental impact. A final real estate acquisition line will be established and a report will be prepared for approval the Chief of Engineers to begin acquisition for the floodwall in FY88

SECTION 202 FLOOD CONTROL PROJECTS

I am deeply disappointed that the Senate refused to follow the lead of the House by exempting the Section 202 flood control projects from cost-sharing. This program was authorized and directed to be carried out at "full federal expense" in the Fiscal Year 1981 Energy and Water Development Appropriation bill. Congress made a commitment which obviously one house feels it is not bound to keep. Two Kentucky projects in particular are seriously jeopardized by this position -- the non-structural relocation efforts at Barbourville and the entire project at Harlan. These two are so close to the beginning of construction that you can almost touch them. It has been a crushing blow to all of us to learn that the projects may never proceed any farther.

The communities of the Tug and Levisa Forks of the Big Sandy River and of the Upper Cumberland River desperately need flood walls and relocation efforts to protect them from devastating cyclical floods. But these measures are expensive and the local governments do not have the ability

to pay for them, primarily because the 14 major floods that have occurred in this century have severely hampered economic development efforts in the area. If the Senate's will prevails, we will be left with nothing.

When the time comes to decide who will pay for the "separable elements" of the Section 202 projects, Assistant Secretary of the Army for Civil Works, Mr. Robert Dawson, has indicated his intention "to fully consider the ability to pay provisions prescribed in Section 701(h)" of the Senate-passed omnibus water projects authorization bill. To my mind this is no guarantee that my people will find any relief or that the federal government will keep its promise to them.

If the conferees of H.R. 6 are not able to agree upon language defining what constitutes a local sponsor's ability to pay, I would ask that your subcommittee consider such. To ensure fair treatment of all communities, not just those in Kentucky, and to ensure even-handed and apolitical application of the waiver of the cost-sharing requirement, we should create a specific set of guidelines. Included should be such factors as an area's per capita income, its poverty level and its unemployment rate.

Mr. Chairman, I appreciate the attention of the Subcommittee on Energy and Water Developmment to the Commonwealth of Kentucky and its interests.

Sincerely,

The Honorable Tom Bevill
Chairman, Subcommittee on
Energy and Water Development
House Committee on Appropriations
Washington, D.C. 20515

DEPARTMENT OF THE ARMY
OHIO RIVER DIVISION . CORPS OF ENGINEERS
P. O. BOX 1159
CINCINNATI. OHIO 45201

13 MAR 1986

Mr. R. Barry Palmer
Executive Director
DINAMO/OVIA
Three Gateway Center
Pittsburgh, Pennsylvania 15222

Dear Mr. Palmer: Barry

I refer to your 11 March 1986 telephone request for information on the Fiscal Year 1987 President's budget and approved capabilities for the ORD navigation program. You further requested information on progress to date and future activities scheduled for the Grays Landing project.

I believe the attached table and status report on Grays Landing responds to your request.

Your knowledge of the Ohio River System and support for safe, efficient and cost effective navigation modernization has provided valuable input to our overall navigation program. Please advise if we can be of further assistance.

Sincerely,

2 Encls

Peter J. Offringa
Brigadier General, U.S. Army
Division Engineer

Appreciate your continued interest.

CORPS OF ENGINEERS
NAVIGATION FUNDING CAPABILITIES FOR FISCAL YEAR 1987
IN THE OHIO RIVER BASIN

DATE: 13 JANUARY 1986

NAME OF SURVEY OR PROJECT	CATAGORY	CAPABILITY 1/	PURPOSE OF ADDITIONAL CAPABILITY
Wabash River	Planning	$350,000	Advance Completion of Interim Feasibility Study 2 Months
Olmsted L&D	CP&E	$2,500,000	Advance Study Completion 4 Months
Grays Landing L&D	Construction	$4,200,000	Initiate Real Estate Acquisition

1/ Although project and study capabilities reflect the readiness of the work for accomplishment, they are in competition for available funds and manpower Army-wide. In this context, the Fiscal Year 1987 capability amounts shown consider each project or study by itself without reference to the rest of the program. However, it is emphasized that the total amount proposed for the Army's Civil Works Program in the President's Budget for Fiscal Year 1987 is the appropriate amount consistent with the Administration's assessment of national priorities for Federal investments and Government borrowing is having on the national economy. Therfore, while we could utilize additional funds on individual projects and studies, offsetting reductions would be required in order to maintain our overall bugetary objectives.

FY87 Funding for ORD Navigation Studies

Project/Study	President's FY87 Budget Thousand $	FY87 Funds Utilization
FEASIBILITY STUDIES		
Lower Mon (L&D's 2,3 & 4)	700	Complete Condition Studies, Initiate Draft Report
Ohio River Mainstem	(2,560)	
Upper Ohio (E,D & M L&D's)	810	Continue Condition Studies, Economic and Environmental Evaluations
Lower Ohio (McAlpine L&D)	900	Continue Economic Studies & Environmental Studies
Kanawha River (Marmet L&D)	650	Begin Condition, Economic & Environmental Investigations
Big Sandy River	165	Complete Final Report
Lower Kentucky River	430	Complete Final Report
Wabash River	200	Complete Recon Study, Initiate Feasibility Study if Warranted
Cumberland/Tennessee	(1,450)	
Upper Cumb./Tenn	760	Continue Navigation system evaluations
Lower Cumberland	140	Complete Final Report
CONTINUED PLANNING AND ENGINEERING		
Olmsted L&D	1,500	Continue site mapping, foundation investigations & hydraulic modeling
CONSTRUCTION (DESIGN & REAL ESTATE ACQUISITION)		
Winfield L&D	1,750	Prepare General Design Memorandom
Grays Landing L&D	670	Complete L&D Design & Relocation Feature Design Memos
Point Marion L&D	730	Complete the General Design Memo and Initiate Feature Designs
Gallipolis L&D	3,500	Continue Real Estate Acquisition and Engineering Design
TOTAL	12,905	

Status Report - Grays Landing (Mon L&D 7 Replacement)

In January 1986 the Pittsburgh District's General Design Memorandum and Real Estate Feature Design Memorandum were approved for the proposed Grays Landing site. These reports were prepared under the Continuing Planning and Engineering (CP&E) phase of project development.

Subsequent to HQUSACE approval of the CP&E reports, the Pittsburgh District requested authorization and funding to initiate land acquisition for the Grays Landing site. That request was endorsed by the Ohio River Division and forwarded to HQUSACE on 28 Feb 86 for further endorsement to the Assistant Secretary of the Army for Civil Works (ASA/CW) for approval.

Assuming ASA/CW approval, and based on our Gallipolis experience (approval took one month), we could be in position to initiate land acquisition activities this spring. Our current schedule indicates that acquisition of tracts would begin in October 1987 and would be completed in March 1989; assuming, of course, a Spring 1986 approval to begin pre-acquisition work. Following that sequence the first construction contracts for lock and dam features could be awarded about April 1989 if construction authorization has occurred.

Mr. NATCHER. And further, I would like to ask unanimous consent that statements of any of the other members who are not here at this time be filed at the proper place.

And again, I want you and the members of your committee to know that we appreciate the opportunity to appear. We appreciate your help all down through the years. Thank you very much.

Mr. BEVILL. Thank you. We very much appreciate the entire Kentucky Delegation. You have been great to work with, and we all in this subcommittee appreciate you, and tell Chris to be sure to put that Yatesville Dam in.

Mr. NATCHER. I will do it.

Thank you, Mr. Chairman.

[The information follows:]

LARRY J. HOPKINS
6TH DISTRICT, KENTUCKY

COMMITTEES:
AGRICULTURE
ARMED SERVICES

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Congress of the United States
House of Representatives

April 10, 1986

The Honorable Tom Bevill
Chairman,
Subcommittee, Energy & Water Dev.
Committee on Appropriations
U.S. House of Representatives
Washington, D.C. 20515

Dear Mr. Chairman:

Thank you for this opportunity to share the needs of the Sixth District of Kentucky with the Subcommittee.

Today I would like to express my support for a provision in the President's Fiscal Year 1987 budget request for $400,000 for the purpose of conducting a reconnaissance study to address the opportunities for multipurpose project development in the Station Camp Creek drainage basin.

This project could prove to be a way to increase the water supply of Central Kentucky. This study would focus on a possible reservoir on Station Camp Creek within the Daniel Boone National Forest and close to the Jackson County-Estill County-Lee County juncture. Station Camp Creek is a major tributary of the Kentucky River and joins the Kentucky River at Irvine (Estill County). Catching water at a reservoir on Station Camp Creek would allow stored water to be released during drought periods to supplement the low flows in the Kentucky River.

In an Army Corps of Engineer's 1978 report entitled Water Supply Alternatives to Red River Lake, the Station Camp Creek alternative stood out (among a significant array of alternatives) as the one with the least total cost (including the present worth of the operation and maintenance costs).

The report concluded that communities with water supply intakes in the Kentucky River downstream of the confluence of the Dix River had no foreseeable water supply problems, while communities upstream would have water supply problems if drought conditions similar to 1930 or 1953 recurred.

The reservoir site would drain a 91 square mile area, have a surface area of approximately 820 acres, and would contain approximately 7.5 billion gallons of active water supply storage space. At current price levels the project would cost on the order of $14 million.

The Station Camp Creek alternative, taken together with certain assumptions as outlined in the Corps' 1978 study, would meet the projected demands through the year 2030 under rainfall/streamflow conditions of the most serious historical drought in Central Kentucky -- that being the 1930 drought.

The Kentucky River Basin communities of Lancaster, Lexington, Nicholasville, Richmond, and Winchester were each seen by the Corps to need supplemental sources of water supply. These five systems, together with the rural water systems they supply represent approximately 265,000 Central Kentuckians.

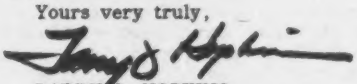
Through interconnections, the following additional communities could also stand to benefit by the construction of a reservoir such as the one proposed at Station Camp Creek: Georgetown, Millersburg, North Middletown, Paris, Stamping Ground, and Stanford. These six areas, together with the rural water systems they supply, represent another 31,000 potential beneficiaries.

Adding these two groups of people together yields a total number of 296,000 Central Kentuckians potentially benefitting from such a project.

Having identified the problem, the possible beneficiaries, and a possible alternative. I at this time believe we should move forward on the Station Camp Creek proposal.

I urge the members of this subcommittee to support the Administration's request to fund this necessary study.

Yours very truly,



LARRY J. HOPKINS
Member of Congress

LJH/mk

STATEMENT OF THE HONORABLE CARL C. PERKINS BEFORE THE SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT OF THE COMMITTEE ON APPROPRIATIONS.

Mr. Chairman:

I would like to thank you for allowing me the privilege of appearing before this Subcommittee today. I want to commend you and the Subcommittee for the excellent work done in developing our nation's water resources and furthering the development of the Appalachian region. Without the leadership shown by you and the Subcommittee, hundreds of thousands of Americans would be living in the constant danger of flooding and many hundreds of thousands would not have the economic opportunity for productive work that is provided by the various navigation development projects and transportation projects provided for by this Subcommittee.

I would like to talk specifically about the needs of the 7th District of Kentucky for the coming year. As you know, the construction was recomenced on the Yatesville Dam at Blaine in Lawrence County. . The diversion tunnel and stilling basin are completed. Bids were advertised for the main dam structure earlier this year and were received on February 25, 1986 by the Huntington Office of the Corps of Engineers. In addition, earlier this year a contract for 1.2 million was let for road relocation. The apparent low bid for the main dam structure was 24.7 million. This was approximately 12% higher than estimated. I was a little bit surprised the bids were coming in a little

higher and from my investigation it appears that this is occurring throughtout the nation since the construction business is picking up. We are just not getting the excellent low bids these days that we got a few years ago. From my investigation, in order to continue work on the Yatesville Reservoir and the purchase of additional real estate and other activities, approximately 8 million dollars will be needed during fiscal year 1987 to keep everything on track. I certainly understand the budget constraints under which the Subcommittee is operating and I hope you will be able to include 8 million for Yatesville Lake in your FY 87 Appropriations Bill.

Now I would like to turn to another project with which the Subcommittee is familiar and that is the South Williamson. Ky. structural and non-structural project. From my best information at this point, it appears that the Corps of Engineers will be able to start actual work this fall, in the September/October time frame. The South Williamson area is located on the Tug Fork of the Big Sandy River. This area is regularly ravaged by floods and the most recent one was in May, 1984. The May, 1984 flood almost equaled the total damage of the April 1977 flood. I have been concerned that the Corps has not moved as aggressively as I thought they should have on the Kentucky side of Tug Fork. but it appears they are finally getting ready to actually start work. I would, therefore, request that the Subcommittee would include 1 million for the South Williamson, Kentucky project.

Now I would like to turn to problems on the Levisa Fork of the Big Sandy River. The Levisa Fork splits off the Tug Fork at

Louisa and goes right through the heart of Eastern Kentucky pass the towns of Paintsville, Prestonsburg, Martin, Pikeville and Elkhorn City with its head waters in Dickinson County, Virginia. Much has been accomplished on flood control on the Levisa Fork over the past 40 years and without the various measures which have been constructed, the area would have been more devastated than it was in the flood of 1977 and 1984. The Levisa Fork is covered under the same authorization as the Tug Fork. I have become very concerned that the Corps of Engineers have not moved as aggressively as possible in addressing the need of Levisa Fork and so have voiced my opinion to them on several occasions. One feature of the Levisa Fork flood protection project of which this Subcommittee is familiar, is the Haysi Reservoir to be located on the Russell Fork of the Levisa Fork in Dickinson County near the community of Haysi. This project as the Subcommittee is aware, is also very strongly supported by our colleague, Congressman Boucher. Rick and I have a little contest going to see who has the greatest enthusiasm for this project. My father had been wanting to see this go forward since the 1950's. According to Corps studies this reservoir would reduce the flood crest by a matter of feet on the way down the Levisa Fork. This reservoir would reduce the height of needed flood walls on down the Levisa Fork and also means that less non-structural work would be needed in the Levisa basin. It is almost impossible to exaggerate the very positive flood reduction capability of Haysi. With the funds appropriated previously by this Subcommittee, the Corps of Engineers has begun preliminary engineering and core drilling and is moving forward, although not as quickly as Rick and

I would wish. I would, therefore, request that the Subcommittee include 1 million dollars for the Haysi Reservoir in Dickinson County, Virginia.

One final project is a small local protection project at Salyersville for which this Subcommittee has provided funds in years past and I would hope that the Subcommittee would be able to include $300,000 for that project. The Town of Salyersville is located on the Licking River and has severe flooding every three or four years. The community has many elderly and low income people and this will help many of those in Salyersville.

I certainly understand the constraints under which the Subcommittee is operating as a result of the budgetary proposals and I might add I voted against Gram-Rudman. I hope that the Subcommittee will be able to favorably consider the requests I have made on behalf of the people I am privileged to represent.

Again, thank you for allowing me the privilege of appearing before you today.

THURSDAY, APRIL 10, 1986.

MISSOURI PROJECTS

WITNESS

HON. ROBERT A. YOUNG, MISSOURI

Mr. BEVILL. We also look forward to hearing the testimony of our good friend Congressman Young. Your formal statement will be made part of the record, and you may proceed as you wish.

Mr. YOUNG. Thank you very much, Mr. Chairman, Mr. Myers, members of the subcommittee.

I appreciate the opportunity to appear before you today in support of continued funding of water projects which are vital to my district and the State of Missouri.

I would first like to thank you for the assistance which you have always provided to the 2nd District of Missouri. I know that we share a deep interest in and concern for maintaining and improving the water resources of our nation.

Mr. Chairman, I am pleased to report that the Administration budget request has included funding for several important projects which have been supported by this subcommittee in the past. I appreciate this demonstration of the Administration's commitment to these projects.

Unfortunately, however, the budget request did not include funding for a project which is extremely important to the St. Louis area and the State of Missouri—the St. Louis Harbor Study. This study has been strongly supported by this committee in the past, receiving appropriations in Fiscal Years 1985 and 1986. In 1986, funding of the study was requested in the President's budget.

In addition, Congress has further indicated support for this project by including authorization for the project in both the House and Senate versions of Omnibus Water Resources legislation which has now passed both houses and is awaiting conference.

As you are aware, Mr. Chairman, the study addresses sedimentation problems which have hampered access to the public dock owned by the City of St. Louis. It is anticipated that the project will result in a reduction of costs of obtaining access to barge transportation. I would like to emphasize that the project is strongly supported by the local interests. In fact, I believe you have received a letter from the Missouri Highway and Transportation Commission expressing the State's commitment to the project and stating that Missouri has already allocated funds for construction.

In summary, Mr. Chairman, I believe that the St. Louis Harbor Study is an excellent example of the type of project which deserves continued funding by your subcommittee. It offers clear benefits to navigation and a strong local commitment to cost-sharing by the local interests. It is also a project which has received the endorsement of the Congress through both the appropriation and authorization processes.

Therefore, I respectfully request that the subcommittee include $300,000 in the Fiscal Year 1987 budget for continuation of the St. Louis Harbor Study.

Thank you again for the opportunity to appear before you today.

THURSDAY, APRIL 10, 1986.

WATER RESOURCES PROGRAM

WITNESSES

GARY P. LA GRANGE, CHAIRMAN, WATER RESOURCES CONGRESS (WRC)
RAY LEONARD, PRESIDENT, WRC

Mr. BEVILL. I see our friend and colleague, Mr. LaGrange, is here, and so we will hear you at this time. You are scheduled next.

Mr. LAGRANGE. Thank you. Thank you, members of the committee.

I am Gary P. LaGrange, Chairman of the Water Resources Congress. I live and work at the water's edge as Executive Director of the West St. Mary Parish Port, Harbor and Terminal District in Franklin, Louisiana.

My tenure in water resource development is but a drop in the bucket compared to the generations of interest, support and active participation by Water Resources Congress in flood control, navigation, irrigation, generation of hydro-electric power, municipal and industrial water supply, recreation and related benefits derived from sound, economically justified water projects.

The offspring of the Mississippi Valley Association and the National Rivers and Harbors Congress, this association goes back to 1902.

While we feel duty-bound to come to Washington year in and year out to testify in support of the budgets of the Corps of Engineers civil works program and that of the Bureau of Reclamation, we well know that our appearance here today and in previous years is made possible by this committee.

I firmly believe that all water-oriented associations like ours share our conviction that were it not for the interest and legislative efforts of this committee, we would all be back to square one in river basin development.

Instead of spending time supporting the Federal water resources budget, we would probably be filling sandbags on the river banks, moving our commerce by rail and highway and praying for rain to nourish thirsty acres.

Now that the Senate has joined the House in enacting a water resources project authorization bill, we anxiously await the reopening of the water project pipeline.

We know full well, however, that road between authorization and appropriations can be a long one and Federal budget cut-backs promise to make it even longer.

But of immediate concern to Water Resources Congress are the projects which were authorized, received initial funding and placed under construction only to have these developments become embroiled in controversy, litigation, and needless changes in scope which have brought them to a halt.

Now as they try to get back into construction, they face severe budget problems which could kill them once and for all.

Heading this list is the Garrison Diversion Project in North Dakota. Talk about a battered child of the Pick-Sloan marriage, Garrison is certainly it.

Originally authorized under the 1944 Flood Control Act, Garrison has been studied and re-studied, started and stopped and now faces terminal shut-down.

The Bureau of Reclamation's Fiscal Year 1987 budget puts the bullets in the gun with the request for $18 million and the words, in part, ". . . and for required activities associated with project shutdown."

Maybe the Garrison project, which was promised to the people of North Dakota for their giving up hundreds of thousands of Missouri River bottomlands to accommodate the Garrison reservoir, can yet be salvaged.

Passage of H.R. 1116, the measure to reauthorize the project, will save it from the clutches of termination. We certainly hope so.

WRC recommends that instead of using the $18 for shutdown, the money be applied to continuing the project. If the bill pending in the House is passed, WRC would like to see funds added to the appropriations to match last year's total of $41 million.

The on-again, off-again operation at Garrison is familiar to project advocates of the Narrows Unit in Colorado. Construction of this vital water resources project started in 1973.

Cost sharing provisions in place include repayment contracts with the two conservancy districts involved, power revenues from the sale of Pick-Sloan hydro units, general agreement on the recreation and fish and wildlife features.

Water Resources Congress respectfully requests this committee's support for an appropriation of $5 million to resume construction.

Also in Colorado, we would like to see the Bureau of Reclamation be directed to proceed with the Horsetooth Dam spillway improvement under the dam safety program so this project will not be delayed any longer.

Agreement on cost sharing is holding up work and WRC believes the division of costs would be better accomplished upon completion of the construction.

The Cooper Lake Project of the Corps of Engineers in Texas is another project encountering difficulty in the construction phase.

This project, which has been delayed for more than 15 years, was originally authorized in 1955 and based on local contracts for 100 percent repayment for water supply costs, the project was placed under construction in 1968.

Finally surviving a prolonged court battle, the project has emerged with continuing support of the people in the project area.

The President's Fiscal Year 1987 budget requests $3.7 million to continue construction. However, the Corps of Engineers has developed criteria that will permit construction to be expedited if an additional $3.1 million can be made available.

WRC has learned that this increased capability was not available during preparation of the budget. We would respectfully urge that an appropriation of $6.8 million for the Cooper Lake project be granted.

Among the ongoing projects and studies of the Corps of Engineers and the Bureau of Reclamation, several are deserving of special mention because of their great regional and national benefits.

In Alabama we recognize the importance of keeping appropriations at a level consistent with meeting the completion schedule for Mobile Harbor and the William Bacon Oliver Lock and Dam replacement.

California projects in this category include Dry Creek (Warm Springs) Lake; the Sacramento River Bank protection; Walnut Creek; the All American Canal under the Bureau's General Investigations and the Colorado River Water Quality Improvement Program.

Louisiana projects include the Gulf Intracoastal Waterway; the Mississippi River Ship Channel from the Gulf to Baton Rouge and the Red River Waterway, Mississippi River to Shreveport.

In the Pacific Northwest, we underscore the importance of the Bonneville Navigation Lock; Mount St. Helens interim measures and the Mount St. Helens Sediment Control.

Construction of Lock and Dam 26 on the Mississippi River between Missouri and Illinois as well as the Second Lock at this facility are of the utmost importance.

Appropriations for Tug Fork and Gallipolis Locks and Dam are also urgently needed.

A list of key projects we also consider of regional and national importance are included on the last page of this testimony.

Water Resources Congress realizes the urgent need to reduce the Federal deficit. Also we are well aware of the fierce competition for available Federal dollars.

However, those of us who actively support the Federal role in water resources development do not consider our activities as falling under the category of special interests.

The Federal investment in the Nation's water resources programs has been one of our greatest strengths as it is such a big contributor to our industrial and agricultural economies.

We firmly believe there can be no such thing as a water tight budget. So today, as in years gone by, we respectfully urge your support of the Fiscal Year 1987 budget request of the Corps of Engineers and the Bureau of Reclamation.

Mr. MYERS. Thank you very much.

Mr. LAGRANGE. We appreciate your time.

[The statement of Gary P. LaGrange follows:]

WATER
RESOURCES
CONGRESS

Testimony by

Gary P. La Grange

Chairman

WATER RESOURCES CONGRESS

Before the

Subcommittee on Energy and Water Development

Committee on Appropriations

U. S. House of Representatives

April 10, 1986

I am Gary P. LaGrange, Chairman of the Water Resources Congress. I live and work at the water's edge as Executive Director of the West St. Mary Parish Port, Harbor and Terminal District in Franklin, Louisiana.

My tenure in water resource development is but a drop in the bucket compared to the generations of interest, support and active participation by Water Resources Congress in flood control, navigation, irrigation, generation of hydro-electric power, municipal and industrial water supply, recreation and related benefits derived from sound, economically justified water projects. The offspring of the Mississippi Valley Association and the National Rivers and Harbors Congress, this association goes back to 1902.

While we feel duty-bound to come to Washington year-in-and year-out to testify in support of the budgets of the Corps of Engineers civil works program and that of the Bureau of Reclamation, we well know that our appearance here today and in previous years is made possible by this Committee.

I firmly believe that all water-oriented associations like ours share our conviction that were it not for the interest and legislative efforts of this Committee, we would all be back to square one in river basin development. Instead of spending time supporting the Federal water resources budget, we would probably be filling sandbags on the river banks, moving our commerce by rail and highway and praying for rain to nourish thirsty acres.

Now that the Senate has joined the House in enacting a water resources project authorization bill, we anxiously await the reopening of the water project pipeline. We know full well, however that road between authorization and appropriations can be a long one and Federal budget cut-backs promise to make it even longer.

But of immediate concern to Water Resources Congress are the projects which were authorized, received initial funding and placed under construction only to have these developments become embroiled in controversy, litigation, and needless changes in scope which have brought them to a halt. Now as they try to get back into construction, they face severe budget problems which could kill them once and for all.

Heading this list is the Garrison Diversion Project in North Dakota. Talk about a battered child of the Pick-Sloan marriage, Garrison is certainly it. Originally authorized under the 1944 Flood Control Act, Garrison has been studied and re-studied, started and stopped and now faces terminal shut-down. The Bureau of Reclamation's Fiscal Year 1987 budget puts the bullets in the gun with the request for $18 million and the words, in part, "...and for required activities associated with project shutdown."

Maybe the Garrison project, which was promised to the people of North Dakota for their giving-up hundreds-of-thousands of Missouri River bottomlands to accommodate the Garrison reservoir, can yet be salvaged. Passage of H. R. 1116, the measure to reauthorize the project will save it from the clutches of termination. We certainly hope so.

WRC recommends that instead of using the $18 for shutdown, the money be applied to continuing the project, If the bill pending in the House is passed, WRC would like to see funds added to the appropriations to match last year's total of $41 million.

The on-again-off-again operation at Garrison is familiar to project advocates of the Narrows Unit in Colorado. Construction of this vital water resources project started in 1973. Cost sharing provisions in place include repayment contracts with the two conservancy districts involved, power revenues from the sale of Pick-Sloan hydro units, general agreement on the recreation and fish and wildlife features.

Water Resources Congress respectfully requests this Committee's support for an appropriation of $5 million to resume construction.

Also in Colorado, we would also like to see the Bureau of Reclamation be directed to proceed with the Horsetooth Dam spillway improvement under the dam safety program so this project will not be delayed any longer. Agreement on cost sharing is holding up work and WRC believes the division of costs would be better accomplished upon completion of the construction.

The Cooper Lake Project of the Corps of Engineers in Texas is another project encountering difficulty in the construction phase. This project, which has been delayed for more than 15 years, was originally authorized in 1955 andbased on local contracts for 100 percent repayment for water supply cost, the project was placed under construction in 1968.

Finally surviving a prolonged court battle the project has emerged with continuing support of the people in the project area. The President's Fiscal Year '87 budget requests $3.7 million to continue construction. However, the Corps of Engineers has developed criteria that will permit construction to be expedited if an additional $3.1 million dollars can be made available. WRC has learned that this increased capability was not available during preparation of the budget. We would respectfuly urge that an appropriation of $6.8 million dollars for the Cooper Lake project be granted.

Among the ongoing projects and studies of the Corps of Engineers and the Bureau of Reclamation, several are deserving of special mention because of their great regional and national benefits.

In Alabama we recognize the importance of keeping appropriations at a level consistent with meeting the completion schedule for Mobile Harbor and the William Bacon Oliver Lock and Dam replacement.

California projects in this category include Dry Creek (Warm Springs) Lake; the Sacramento River Bank protection; Walnut Creek; the All American Canal under the Bureau's General Investigations and the Colorado River Water Quality improvement program.

Louisiana projects include the Gulf Intracoastal Waterway; the Mississippi River Ship Channel from the Gulf to Baton Rouge and the Red River Waterway, Mississippi River to Shreveport.

In the Pacific Northwest, we underscore the importance of the Bonneville Navigation Lock; Mount St. Helens interim measures and the Mount St. Helens Sediment Control.

Construction of Lock and Dam 26 on the Mississippi River between Missouri and Illinois as well as the Second Lock at this facility are of the utmost importance.

Appropriations for Tug Fork and Gallipolis Locks and Dam are also urgently needed.

A list of key projects we also consider of regional and national importance are included on the last page of this testimony.

Water Resources Congress realizes the urgent need to reduce the federal deficit. Also we are well aware of the fierce competition for available federal dollars. However, those of us who actively support the federal role in water resources development do not consider our activities as falling under the category of special interests. The federal investment in the Nation's water resources programs has been one of our greatest strengths as it is such a big contributor to our industrial and agricultural economies.

We firmly believe there can be no such thing as a water tight budget. So today as in years gone by we respectfully urge your support of the Fiscal Year 1987 budget request of the Corps of Engineers and the Bureau of Reclamation.

Corps of Engineers projects

Threemile Creek, Mobile, AL
Phoenix Arizona & Vicinity, Flood Control
Quachita & Black Rivers, Navigation, Arkansas
Corte Madera Creek, California, Flood Control
Fairfield Vicinity Streams, California, Flood Control
Los Angeles County Drainage, California, Flood Control
Merced County Streams, California, Flood Control
Oakland Outer Harbor, California, Navigation
Richmond Harbor, California, Navigation
Sacramento River Deepwater Ship Channel, California, Navigation
Fountain Creek and Tributaries, Colorado, Flood Damage Prevention
Central & Southern Florida, Flood Control
Tampa Harbor Branch Channels, Florida, Navigation
Brandon Road Lock & Dam, Illinois River, Illinois, Navigation
Evansville, Indiana, Flood Control
Bettendorf, Iowa, Flood Control
Great Bend Kansas, Flood Control
Southwestern Jefferson County, Kentucky, Flood Control
Atch. River & Bayous Chene, Boeuf & Black, Louisiana, Navigation
Bayou Teche, Louisiana
Calcasieu River & Pass, Louisiana, Navigation
Freshwater Bayou, Louisiana, Navigation
Grand Isle & Vicinity, Louisiana, Flood Control
Houma Navigation Canal, Louisiana, Navigation
Lake Providence Harbor, Louisiana, Navigation
LaRose to Golden Meadown, Louisiana, Flood Control
Madison Parish Port, Louisiana, Navigation
Mermentau River, Louisiana, Navigation
Mermentau, Vermilion & Calcasieu Rivers & Bayou Teche, LA, Flood Dam.Preven.
Miss. River Outlets at Venice, Louisiana, Navigation
Miss. River, Baton Rouge to the Gulf of Mexico, LA., Navigation
Miss. River Gulf Outlet, Louisiana, Navigation
Upper Bayou Teche, Louisiana, Flood Damage Prevention
Baltimore Harbor & Channels, Maryland & VA, Navigation
Mankato & North Mankato, Minnesota, Flood Control
Tombigbee River & Tributaries, Miss & Alabama, Flood Control
Blue River Channel, Missouri, Flood Control
Papillion Creek & Tributaries Lakes, Nebraska, Flood Control
Kill Van Kull & Newark Bay Channel, New York & New Jersey, Navigation
Mill Creek, Ohio, Flood Control
Grays Landing, Lock & Dam 7, Monongahela River, PA, Navigation
Point Marion, Lock & Dam 8, Monongahela River, PA & WV, Navigation
Buffalo Bayou & Tribs, Addicks & Barker Dams, Texas, Flood Control
Clear Creek Texas, Flood Control
Corpus Christi Ship Channel, Texas, Navigation
Freeport Harbor, Texas, Navigation

Bureau of Reclamation projects

Central Arizona Project
Central Valley Projects, California
Animas-La Plata, Colorado-New Mexico
Dolores Project, Colorado
San Luis Valley Project, Colorado
Nueces River Project, Texas
Columbia Basin Project, Washington

Mr. MYERS. I apologize. The Chairman had to go to the Floor to vote. I must go now, but the committee will stand in recess for five minutes while we vote.

Good to have you back again.

[Recess.]

THURSDAY, APRIL 10, 1986.

MOBILE HARBOR

WITNESS

MYRT JONES, PRESIDENT, THE MOBILE BAY AUDUBON SOCIETY

Mr. BEVILL. The committee will come to order.

Next we have Mrs. Myrt Jones. Mrs. Jones, we are glad to have you with us here. We will hear from you, and your prepared statement will be made a part of the record, and you may proceed as you wish.

Mrs. JONES. All right. I thought you gentlemen might like to see why I am here. This is the Mobile Bay area, and this is why so many of us are concerned, and I appreciate this opportunity to come before this committee.

The Mobile Bay and the Chesapeake Bay are both stressed, vital, sensitive and natural estuarian systems. The Chesapeake is receiving Federal monies to address these problems. The Mobile Bay system is not, but I hope, Mr. Chairman, that our Congressional representatives will listen to the needs and concerns of the oystermen and fishermen whose livelihoods are being threatened, and I hope you also consider funding a bay management plan that would help us to address some of the problems that we are being faced with, and also help us to provide access for people to get into the delta, to get into the waterfront, to get into the bay and to also get into the Gulf of Mexico.

As you well know, we have thousands of visitors coming into our area plus a lot of our Alabamans that can't even enjoy these waterfront areas.

This complete ecosystem supports billion-dollar industries, such as tourism, sport and commercial fisheries, and provides thousands of jobs. The only reason for deepening the Mobile Ship Channel is the purported economic savings of shipping and deeper draft vessels, and this is a Model T approach. The shipping industry is in the most severe slump since the Great Depression. Many of these deep draft vessels are being turned into scrap metal. The barging industry is in deep financial trouble. I am told that as many as a fifth to a third may be out of business by the end of 1986, and all along the banks of the Lower Tennessee-Tombigbee Waterway. In the delta we are being faced with a problem of abandoned barges.

The alternative method is the proven cost effective- -I mean environmentally acceptable topping off, which has been done in our area on two occasions, you are aware, and is used all over the world. Congress, the people of Alabama and the taxpayers of the United States are again being misled by the phantom projections being set forth by the Corps of Engineers.

The Tennessee-Tombigbee Waterway is the best example. Instead of the Corps of Engineers' predicted 27.3 million tons of commodities, only 1.7 million tons of cargo, which is barely six percent of the tonnage that was estimated—they only missed it by 94 percent—used the Tennessee-Tombigbee Waterway, and it came through the Port of Mobile last year. The State of Alabama dock facilities are using monies.

According to a recent survey, Alabama is one of the 30 states identified in the phenomenon of original recessions. The Alabama State Dock's McDuffie coal handling facility is operating below projected levels, approximately 30 percent of capacity. According to the world market reports, foreign-produced coal could be competitive enough on the U.S. markets to take a 17.5 million tons share of coal markets by 1990.

Congress appears to be supporting the proposal of deepening the Mobile Ship Channel, we call it the ditch. The environmental impact statements promoting the ditch are prime candidates for litigation. Besides sinking $.5 billion of taxpayers' money in the Corps' first phase of an unnecessary ditch, the major concern by all state and Federal agencies and our groups is the proposed taking of the 1700 acres of publicly owned land, replacement of 64 million yards of dredge materials for an island. These 1700 acres are prime productive acreage for seafood, wildlife and is a valuable dispersing area for the flood waters that come down from the delta.

The remaining 102 to 142 million cubic yards of dredge material is planned to be dumped in a selected site in the Gulf of Mexico. Dead areas have been identified in the Gulf of Mexico covering thousands of square miles. No fish are caught in these areas. This has not been discussed in my environmental impact statement. For years an extremely heated situation has involved the Corps' open bay disposal of six million cubic yards in maintaining the 40-foot depth. This covers 20,000 acres of bay bottoms every time they maintain the channel. The other agencies support taking the material to the Gulf, but the Corps of Engineers has maintained it was too costly.

The Corps of Engineers and the Alabama State Docks is now considering a transshipment facility because of the administration's cost sharing requirement. We support cost sharing as hopefully better cost effective projects will be proposed, saving taxpayers' monies, making ports more efficient and competitive, and provide for the overall needs.

The proposed transshipment facility has not been addressed in any public document. This violates the legal process, and our recent request for public hearing has been denied. The Corps of Engineers suffers from an incurable disease: DDWD. This is an incurable desire to dig deeper and wider ditches. This committee has the cure. You cannot authorize nor fund this project. We do need continued Congressional financial support for maintaining our channels. We do not need the ports to be in a highly competitive position.

We also need to protect the integrity of the Mobile Bay ecosystem. And, Congressman Bevill, I would like to thank you for when you went before the Coosa, Alabama Improvement Association, you said, "Federal funding for a $1.8 billion waterway linking Rome,

Georgia with Mobile will be delayed at least until 1991. With the tight money, we will just have to be realistic. The Gramm-Rudman Budget Balancing Act is going to prevent us from making a major investment in any new waterway project." The same principle applies to the proposed deepening.

I would like to thank you for considering our viewpoints. Do you have any questions?

[The statement of Myrt Jones follows:]

THE MOBILE BAY AUDUBON SOCIETY

BOX 9903
MOBILE, ALABAMA 36609

TESTIMONY OF MRS. MYRT JONES

PRESIDENT

MOBILE BAY AUDUBON SOCIETY

BEFORE THE

HOUSE ENERGY AND WATER DEVELOPMENT

SUBCOMMITTEE ON APPROPRIATIONS

ON FY '86 MOBILE HARBOR DEEPENING

PROJECT

APRIL 10, 1986

Mr. Chairman and members of the Subcommittee:

Mobile Bay is comparable to Chesapeake Bay in that both are valuable, sensitive, stressed, national and international resources vital to our existance and well-being. Congress recognizes the environmental stresses on the Chesapeake Bay, but our own Congressmen have not realized these same stresses are happening to the Mobile Bay ecosystem.

Coastal Alabama's major billion dollar industries such as recreation, tourism, sport and commercial fisheries depend on a healthy ecosystem and support thousands of jobs. In some ways family traditions are carried on by today's oystermen, shrimpers and fishermen even though it's a tough way to make a living and financially uncertain most of the year.

95% of our commercial and sport fishery are dependent on a healthy ecosystem for some part of their life cycle. To be able to continue to provide a wide diverse variety of seafood for the world, it's imperative to realize this is one whole system and to propose modifying any part of the system can adversely affect the other parts of the system. It's interrelated like a human body-one part depends upon the other for some portion of the total operation in order to work in a healthy manner.

The U.S. Corps of Engineers continues to look at the needs of one industry-the port of Mobile- and that is where the problem lies. In the Environmental Impact Studies, which are potential prime candidates for litigation, for the proposed deepening of the Mobile Bay Ship Channel there are identified data gaps that could pose serious threats to the system if this project is authorized and funded by Congress. There is no effort being taken to fund these data gaps to determine if the integrity of the system will be threatened only the continued efforts to authorize and fund the "ditch" for the export of coal.

The port of Mobile is recognized as a needed and vital part of our heritage and economy and there needs continued financial assistance from Congress for maintenance dredging of the harbor and channel. According to Bob Hope, Director of the Alabama State Docks--"I know in our instance and I think in the majority of the ports that it's going to be extremely hard in this time of economic difficulty to come up with an increasing amount of money for harbor and channel maintenance. The only way ports could come up with the money, in most instances, is to increase charges, and if you increase charges you drive business away. It's sort of a survival situation for ports now."

The federal chamber of commerce or the U.S. Corps of Engineers is again misleading the taxpayer and Congress in promoting a half billion dollar project-the proposed "ditch". This is the same agency that mislead the people of Alabama,

the nation and Congress in supporting the $2 billion dollar Tenn Tom waterway (TTWW), a boondoggle of classic proportions.

According to Business Alabama, March '86-"Alabama business and political sectors had eagerly awaited completion of the TTWW. TTWW advocates bragged that utilization of the waterway would make Alabama economically strong, but the first year of operation has been dismal and disappointing."

The article continues-"According to the U.S. Corps of Engineers (COE) 1976 projections, 27.3 million tons of commodities should have been shipped on the waterway in its first year of operation. Even last summer officials of the Tenn-Tom Waterway Development Authority were hoping it would carry 15 million tons.".

The New York Times, February 16, '86-"The TTWW was opened in January 1985 and has come up embarrassingly short of expectations. In its first 12 months, according to figures made public in February '86, 1.7 million tons of cargo, barely 6% of the tonnage originally predicted, moved on the 234 mile waterway and about half of that was coal."

According to Dr. Semoon Chang, Professor of Economics at the University of South Alabama report-Estimating Savings in Transportation Costs From Use of the TTWW-February'86--"The actual tonnage on the TTWW since its opening in January '85 is substantially lower than was predicted by the COE. The overestimation of tonnage is due to:

(1)the reduced worldwide demand for U.S. coal and grain
(2)the implicit and erroneous assumption that the TTWW may be used as a lower cost alternative waterway to the Mississippi River
(3)and competition in world markets from foreign markets from foreign producers of metallurgical coal.

Another source mentions the COE-"phantom freight"
Dr. Chang continues-"In 1984 and '85 the high price of the dollar on foreign exchange markets has further depressed markets for all exports, including coal, grain, wood products, etc. all commodities which make up the bulk of the cargo on the TTWW and through the port of Mobile."

A recent study by an Annapolis, Maryland consulting firm indicates that under certain conditions of foreign exchange rates, relative prices of oil and coal, and other factors, foreign-produced coal could be competitive enough on U.S. markets to take a 17.5 million ton share of the market by 1990 at utilities along the Mississippi River and the Great Lakes. The strong and primary competitors of U.S. coal producers, would be Columbia, South Africa, Canada, Australia, and Poland in world markets.

Mexican suppliers of building stone are successfully competing with U.S. suppliers, even in U.S. markets. European

suppliers of some hardwood products are also meeting U.S. producers' lowest prices in Latin America.

Changes are taking place worldwide in shipping technology. The world's fleet of deep draft tankers and other cargo vessels is 30% larger than necessary to do the amount of work available. The huge surplus of hulls for hire has put ship owners and builders into their most severe slump since the Great Depression. The battle for business has severely corroded cargo-hauling rates and the values of ships. It costs only about $7 today to move a ton of grain from New Orleans to Amsterdam, in contrast to $17 in 1981. The director general of the port of Antwerp says, "World shipping is very sick and no-body knows when it's going to get any better."

One magnate sold a large part of his fleet for scrap and put the $45 million received into real estate and other investments. The busiest yard is in the port of Kaoshiung, Taiwan, where ships are broken down into scrap metal that is then generally turned into concrete-reinforcing rods.

According to Peter Van der Lender of Transportation Concept and Techniques, Inc. of Charlottesville, Va."The huge recession in shipping is causing the big and small ships to be leased at the same price-there is no savings in shipping out in the deeper vessels today. A 150,000 ton vessel now leases for the same price as a 75,000 ton vessel."

Transportation Concept and Techniques, Inc. is the world's largest transferring company of crude oil, coal and grain. The concept of "topping off" has been employed out of our port on two occassions-

On May 6, 1983-the first "topping off" took place in the Gulf of Mexico after the Koho Maru took on 70,000 long tons of Drummond coal at the Alabama State Docks McDuffie Coal Handling Facility and then sailed to a site 30 miles south of the mouth of Mobile Bay where it was locked together with the self-loading vessel Marcona Conveyor and received the balance of the 105,000 tons. This operation took approximately 16 hours in relatively calm seas.

The second successful transfer of coal from one vessel to another was completed July 4, 1983. The Japanese coal ship Shinzui Maru took on 72,000 tons of Drummond coal at the McDuffie Coal Facility and then proceeded to the transfer site in the Gulf of Mexico where the Maru and the Marcona Conveyor were linked together and "topped off" to about 110,000 tons. The transfer took place in four to five foot seas with a tremendous current, but everything went well. According to Mr. Van der Lender transfers can be safely conducted in 10 foot seas and higher.

It is this economically proven alternative that negates any need for the "ditch" or any other modification to accomodate deep draft vessels. Why sink hundreds of millions of dollars into a "ditch" when the 40' depth can accomodate the big vessels??

At present the preferred plan addressed in the Corps of Engineers' EIS's is to deepen from 40' to 55' plus from McDuffie Facility to Gulf of Mexico approximately 30 miles and take approximately seven-eight years. The upper 63,400,000 cu. yds. of material is planned to be used to construct a 1,700 acre island off Brookley. This area is very shallow bay bottoms and wetlands are involved and some of the most productive acreage in bay system. All of the state and federal agencies as well as groups oppose this land grab of public property for private development plus the loss of the free societal benefits accrued from this acreage. The Corps of Engineers has blatantly ignored these objections.

The federal and state agencies support the dumping of the proposed 102,000,000-142,000,000 cu. yds. of dredged material in a selected site in the Gulf of Mexico. The potential impacts on dumping this amount of material in the enclosed Gulf of Mexico is unknown."Dead areas"involving thousands of sq. miles in the Gulf have been identified, but the reasons for these areas are of unknown causes. No fish are caught in these areas

At present the COE continues the practice of "open bay" disposal of approximately 6 mil. cu. yds. in maintaining the channel, because the COE says it would be too costly to carry the material to the Gulf. Each year 20,000 acres of bay bottoms are covered.

The proposed transshipment facility in the southern part of Mobile Bay has not been properly considered and presented to the public. This Society has requested a public hearing and been denied by the Corps of Engineers.

In requesting information regarding the proposed cost-sharing for the proposed"ditch" we were primarily interested in what the State of Alabama's share would cost we the taxpayer-The COE states-"we are presently negotiating the first phase and a construction schedule compatible with the Ala. State Docks' ability to finance the non-Federal share." According to the letter neither the COE or the State Docks have a plan, yet they are requesting Congress to authorize and fund as of yet an unknown project.

On March 22, 1986 Sindlinger & Co. released a survey identifying the "phenomenon of regional recessions". Out of the 30 states having a recession, Alabama is identified as one of them.

As the representative of the Mobile Bay Audubon Society and an Alabamian I personally extend my appreciation to Congressman Tom Bevill for his remarks before the Coosa-Alabama River Improvement Ass'n that "federal funding for a $1.8 billion dollar waterway linking Rome, Georgia with Mobile will be delayed at least until 1991. With the tight money, we'll just have to be realistic. The Gramm-Rudman budget balancing act is going to prevent us from making a major investment in any new waterway project."

Members of Congress--The same principle applies to the "ditch"

Thank you for considering our views.

Mr. BEVILL. You have provided the committee some information there that hasn't been presented before, and we appreciate that, because we do want to hear all the good, as well as the bad, so that we can weigh it and act more intelligently on it.

I don't quite get, though, what you are recommending. You expressed concern for the fishermen and oystermen. But what is it you are recommending that we do?

Mrs. JONES. That you somehow remove that supplemental plan that puts into effect the deepening of the ship channel, that the deepening is not needed. There are many problems that have not been addressed in the environmental impact statements regarding the deepening. If the deepening is in place, we may be importing coal, grain, iron ore and, therefore, depressing the markets within our nation.

So the main thing that we are asking is that the deepening of the ship channel not be authorized and not be funded.

Mr. BEVILL. Now, you know the Corps has recommended for years, the authorizing committees in the Congress have authorized, the Appropriations Committee has authorized the studies. We have had studies, not just on the Mobile Harbor, but New Orleans, Norfolk, New York, Baltimore, one in Texas, one in California. And these harbors, all without exception, are considered very critical that the harbors be deepened.

Because what has happened in the first place, 80 percent of our exports are going through our inland waterways and the Tennessee-Tombigbee. And for the first time in history now we have about a $125 million debt. We are importing more than we are exporting, and what we are doing is exporting jobs. When we import more than we export, we are in effect exporting jobs.

Ms. JONES. That is correct.

Mr. BEVILL. Now we have 35 percent of the business vessels that haul grain, coal, or any kind of bulk goods, the largest in the world. Thirty-five percent of those largest vessels cannot get into a single port in the United States. They can't get out once they are loaded. They cannot come in and load. I think you agree that we can put these embargoes, we can put these limitations by acts of Congress on imports, but the bottom line is we have to be competitive in the international marketplace.

What would you recommend that we do to be competitive in the international market?

Ms. JONES. I believe just what I suggested, sir. Not to deepen the ship channel for one thing. That is going to be a tremendous amount of money that we are going to put into one project. The deep ships can come into our harbor.

Mr. BEVILL. I mean go out loaded——

Ms. JONES. No, sir, they can come in and they can get 70,000 tons in the 40-foot ship channel that we now have. They can easily go out 30 miles in the Gulf of Mexico and connect to this conveyor-type vessel, which they have done on two occasions, and load to 30,000. This is cost effective, this is not sinking a lot of money into one project when we have so many other needs.

So then we can be competitive, we can allow the few remaining ships, the deep draft vessels that are being held onto, we can allow

them to come in our port and put the 70,000-plus tons into the vessel and then go out and top off.

The gentleman in Virginia that I talked to, he is in the report that you have, Van der Lender, he does this all over the world. They top off coal, grain, iron ore, and they can do it anywhere. They can do it in ten to 20-foot seas, if necessary. This is an alternative to deepening. If you have not been to our area, we do not have access to our waterfront. The visitors coming from all over the world, they have to go to a little bitty place at the foot of Government Street and watch those beautiful ships come through. They have no access to the Bay. You have a quarter of a mile at Dolphin Island for all the thousands of people.

So, you know, we would like to receive money from Congress to keep our port competitive, and I believe that deepening would be extremely costly and damaging, and it may even hurt us. Because you may be allowing more imports to come in because of the foreign markets becoming more competitive.

Mr. BEVILL. You disagree with the environmental report that was made on the project, on the deepening of the channel?

Ms. JONES. Yes, sir. Not only us, but the National Audubon Society and Sierra Club. There are some very serious reservations about the inadequacies of those EIS's.

Mr. BEVILL. Any other questions?

Mr. Rudd.

Mr. RUDD. Thank you, Mr. Chairman.

You know, I adore your city. Mobile is really something. And, of course, I am an old Navy-Marine Corps type, and I can never forget what Admiral Farragut said. It is a part of Naval tradition.

One of the most beautiful adornments, if you want to call it that, that any city has is the ALABAMA sitting there at rest in the Bay. It is so impressive and makes you understand that that battleship, if it were back in service, would be something that would be very impressive to people anywhere in the world within 200 miles of shore. But I am very proud of the fact that we put that ship there because it is such a testimonial to our Naval lore and tradition, and I think you are very fortunate, and congratulations.

Ms. JONES. Thank you. You might be interested to know I am working with the Battleship Commission. Last year I suggested they construct a boardwalk into Pento Pass, and now I am working with the Commission to make that an interpretive area not only for the values of the wetlands it is in, but also to bring out the significant Confederate batteries in that adjacent area that were constructed to protect the City of Mobile.

Mr. RUDD. Congratulations on being a resident of Mobile.

Mr. BEVILL. Any other questions? Thank you very much.

Ms. JONES. Mr. Bevill, if you need any further information, please let me know.

Mr. BEVILL. All right. We appreciate your coming.

Ms. JONES. Certainly, as you are well aware, I have been trying to work with the Corps of Engineers all of these years and trying to look at the overall need of the community, and I have been working very strongly to keep the Corps right at the top of the list.

Thank you very much, gentlemen.

Mr. BEVILL. Thank you very much for your testimony.

THURSDAY, APRIL 10, 1986.

UPPER MISSISSIPPI RIVER ENVIRONMENTAL MANAGEMENT PROGRAMS

WITNESSES

HON. STEVE GUNDERSON, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF WISCONSIN

FREDERICK A. BRUNNER, DIRECTOR, MISSOURI DEPARTMENT OF NATURAL RESOURCES AND CHAIRMAN, UPPER MISSISSIPPI RIVER BASIN ASSOCIATION

JAMES H. HARRISON, EXECUTIVE DIRECTOR, MINNESOTA-WISCONSIN BOUNDARY AREA COMMISSION

Mr. BEVILL. I see our good friend and colleague, Congressman Steve Gunderson of Wisconsin, is here. We would be happy to hear from you now.

Mr. GUNDERSON. It is indeed a pleasure for me to appear before this distinguished committee. With me today is Fred Brunner, representing the Mississippi River Basin Committee. We may or may not have Jim Harrison of the Minnesota-Wisconsin Commission testify with us, as well.

I want to begin——

Mr. BEVILL. If he doesn't get in here, we will be glad to make his statement part of the record.

Mr. GUNDERSON. I want to begin by saying a special thank you to your staffs on both sides of the aisle. You people know more than I the necessity of good staff. Let me tell you, however, you are the experts. Those of us who are not experts continually need to harangue and bother your staff because we need their help and advice. They have been more than patient and kind with us. And I want you and Mr. Myers, in particular, to know how cooperative your staffs and the subcommittee's have been.

Mr. BEVILL. We are really very proud of them. We appreciate them very much and appreciate your kind remarks.

Mr. GUNDERSON. Thank you. We are here today for what is really the beginning of the second phase, I would say, of the effort to preserve the Upper Mississippi River. This committee has been very instrumental in this effort. Your subcommittee was where the great river studies were initiated. As we funded the whole study and authorizations for the second lock and dam in Alton, Illinois, we initiated a start for a master plan for future development of the Upper Mississippi River. Your subcommittee and the supplemental appropriations were very instrumental, and this is one of the projects that was authorized in that language last year.

Now we begin the process of funding the whole plan. If you will look at the Army Corps of Engineers' budget request for fiscal year 1987 for this effort, you will find that they have asked for $1 million. The $1 million requested was legitimate and appropriate at that point in time because the Brigadier General had not yet ap-

proved the General Plan for the development of the Upper Mississippi River.

I would like to quote to you remarks in the General Plan made by Brigadier General Pratt: "Implementation of the Upper Mississippi River System, Environmental Management Plan is essential to the continued viability of the Upper Mississippi River system as we know it, and important to the long-term public acceptance and support of the navigation project." Therefore, we would call to your attention and encourage you to strongly consider the General Plan's recommendations not of $1 million but of $3.95 million, $3.9 million for the first year and the first phase of the balance plan.

We are not asking dollar for dollar for the second lock and dam versus the environmental management plan. The fact is, the second lock is going to cost $245 million. Our program is going to cost probably $180 million. You can't do it dollar for dollar, we understand that. But we come to you and ask that you make the initial commitment this year and send a signal to everyone involved, to Congress and to others, that we are going to follow through with the commitment on both sides to improve navigation, yes, but to also maintain and implement the environmental management program as we have done in the authorized language.

You have been helpful. You gentlemen have been really the key to our success thus far, and we are just asking for that continued cooperation.

I will conclude my remarks and turn it over to Dr. Brunner.

[The statement of Hon. Steve Gunderson follows:]

Statement by

CONGRESSMAN STEVE GUNDERSON

submitted to the

SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

of the

COMMITTEE ON APPROPRIATIONS

April 10, 1986

MR. CHAIRMAN:

Thank you for allowing us the opportunity to testify on the U.S. Army Corps of Engineers Budget for Fiscal Year 1987. Specifically, we are interested in that which is listed on pages 28-29, Lock and Dam 26, Second Lock, IL & MO, and the Upper Mississippi River System Environmental Management Plan, IL, IO, MO, MN, & WI.

Congress made a commitment to the balanced management of the Upper Mississippi River when, in 1978, they passed the Inland Waterways Authorization Act (P.L. 95-502). This legislation authorized the replacement of Locks and Dam 26, but most importantly, directed the Upper Mississippi River Basin Commission to prepare a Comprehensive Master Plan for the Management of the Upper Mississippi River System in cooperation with appropriate Federal, State, and local officials.

The Basin Commission, in turn, accepted the challenge of coordinating the myriad of agencies and interest groups to prepare this massive technical research document commonly known as the Master Plan, and submitting it to Congress in January, 1982.

Since then, the House has passed the basic components of this Plan on two separate occasions. In fact, the Master Plan is the basis for which the Corps of Engineers has developed the Environmental Management Plan listed on page 29 of their budget request.

The 1985 Supplemental Appropriations Act (P.L. 99-88) included authorization and appropriations for, "Locks and Dam 26, Illinois and Missouri (Second Lock), including environmental management along the Upper Mississippi River Basin...". In report language it states that it is the Committee's intent that initial planning and design of the navigation and environmental improvements are to be undertaken simultaneously on equal fiscal footing, to the extent practical and engineeringly feasible. Unfortunately, when the Corps of Engineers submitted their budget request to the President late last year, their General Plan for the Environmental Management Program was to be completed and approved. It is my understanding that their General Plan is now awaiting final approval, if it hasn't received it already, from the Assistant Secretary of the Army.

In the General Plan, Brigadier General Joseph Pratt concludes with the following language:

> "Implementation of the UMRS-EMP is essential to the continued viability of the Upper Mississippi River System as we know it, and important to the long-term public acceptance and support of the navigation project.

Mr. Chairman and members, I could not summarize better the balanced commitment to the multi-use concept and preservation of our beloved river.

Today we begin one of the key elements in implementing that General Plan. And above all else, considering all budget constraints which face you, we seek your assistance in implementing the navigation and Environmental Management Program in the balanced manner embodied in authorizing legislation.

The Army Corps submitted a request of $1 million for the EMP for 1987. However, it is essential that everyone understand this request occurred before the General Plan was received or approved by the regional and Washington offices.

In light of the General Plan's request of $3.95 million for FY87, I would submit this number for consideration from the "balanced" perspective. As you are all aware, the authorizing language calls for a second Lock and Dam at Alton, Illinois, costing between $220-$245 million. The same legislation requests $181.96 million for Environmental Management Programs over ten years.

I respect the budget constraints we all face. And even a debate of a $2.9 million difference in spending can be significant within our overall limits.

However, it is essential this Congress maintain the balanced commitment we have achieved in recent years on the Upper Mississippi River. Certainly, you cannot achieve an exact dollar

for dollar appropriation in each year, nor over the ten year period, as the authorizing language allows navigation to receive $30-$50 million more just for the second lock and dam alone.

But it is essential to maintain, as closely as possible, the proposed timetables for each project. As we near the major appropriations which will occur in FY88 and FY89 for that second lock and dam, it is essential that the commitment to balance have been already made by the Congress.

I have the distinct honor today to have with me two important people who have spent countless hours not only in developing the original Master Plan, but also in lobbying for its adoption by Congress. First, I'd like to introduce Dr. Frederick Brunner, Director of the Missouri Department of Natural Resources who is speaking today not as an official of the State of Missouri, but as the Chairman of the Upper Mississippi River Basin Association, formally the Basin Commission, responsible for the development of the Master Plan. The Basin Association has been designated the caretakers of the Master Plan and is funded by monies appropriated by it five member states, Missouri, Illinois, Iowa, Minnesota and Wisconsin. Secondly, I want to introduce Mr. James Harrison, Executive Director of the Minnesota-Wisconsin Boundary Area Commission. Jim has been involved in Mississippi River issues for many many years and has played an instrumental role in my personal involvement at the congressional level. They would like to take three minutes each to explain their positions.

Dr. BRUNNER. Mr. Chairman and members of the subcommittee, I am Dr. Frederick A. Brunner, Director of the Missouri Department of Natural Resources and Chairman of the Upper Mississippi River Basin Association. I am extremely pleased to be here today to support implementation of the "Comprehensive Master Plan for the Management of the Upper Mississippi River System." I would like to briefly share with you the importance of this program to the states of the Upper Mississippi Basin and the commitment we share to getting this program underway at long last.

The Upper Mississippi River Basin Association was established by the States of Illinois, Iowa, Minnesota, Missouri and Wisconsin in 1982 as a successor to the Upper Mississippi River Basin Commission which originally, under direction from Congress, prepared the master plan. While the association now addressed a variety of water resources issues, the major reason that the states felt compelled to maintain a regional forum after termination of the commission was their desire to see that the recommendations of the commission's master plan are implemented. The states have worked aggressively for the past four years to maintain a high profile for the master plan program and have taken every opportunity to speak to the need for authorizing legislation.

Most recently the states have worked in close cooperation with the Corps of Engineers and the U.S. Fish and Wildlife Service to develop a specific implementation strategy for what has come to be known as the Upper Mississippi River System Environmental Management Program. The states have devoted considerable effort to identifying and prioritizing both habitat enhancement and recreation projects to be constructed as part of this regional program. Various state agencies in the five states have been involved in preparing detailed plans and engineering designs for these projects.

The single most outstanding testimony to the states' dedication to this program is the fact that the Governors, or Governors' representatives, of each of the five states have signed letters of assurance as an expression of their intent to cooperate and cost share with the Federal Government. This indication of the willingness and ability of the states to share in this cooperative venture as financial partners in accordance with the terms of Public Law 99-88, the Fiscal Year 1985 Supplemental Appropriations Act, speaks directly to the states' high regard for this important and unique program.

In conclusion, the Upper Mississippi River Basin Association is aware of the $1 million appropriation recommended in the President's budget and respectively requests that funds for the Upper Mississippi River System Environmental Management Program be included in the Fiscal Year 1987 Energy and Water Development Appropriations bill. I have with me copies of the association's written testimony, which we would ask to have included as part of the hearing record.

Thank you.

Mr. BEVILL. They will all be made part of the record.

[The statement of the Upper Mississippi River Basin Association follows:]

Upper
Mississippi River
Basin Association
ILLINOIS, IOWA, MINNESOTA, MISSOURI, WISCONSIN

Statement of the
Upper Mississippi River Basin Association
before the House Appropriations Energy and Water Development Subcommittee
April 10, 1986

The Upper Mississippi River Basin Association, established by the states of Illinois, Iowa, Minnesota, Missouri, and Wisconsin, serves its member states' needs for dialogue and cooperative action on water resources issues of common concern. The Association's predecessor Commission was the author of the Congressionally authorized "Comprehensive Master Plan for the Management of the Upper Mississippi River System" which, when submitted to Congress in 1982, set in motion what has come to be known as the Environmental Management Program for the Upper Mississippi River System (UMRS-EMP). The Association now serves as the regional forum for the implementation of that program.

The Upper Mississippi River Basin Association supports the inclusion of funds for initial year implementation of the UMRS Environmental Management Program in the FY 1987 Energy and Water Resources Development Appropriations bill. As a long-standing advocate of this program, the Association urges the House Appropriations Committee to provide, at a minimum, funding of $1 million as recommended in the President's budget. The UMRS Environmental Management Program enjoys widespread support in this region. The five states of Illinois, Iowa, Minnesota, Missouri, and Wisconsin, both individually and collectively working through the Association, have devoted significant effort for the past four years to laying the necessary groundwork for the eventual implementation of this unique program. Most recently, the states worked in close cooperation with the Corps of Engineers and the U.S. Fish and Wildlife Service to prepare the "General Plan" which serves as the implementation document for the EMP. Funding in FY 1987 is critical to the continuing viability of this program.

The UMRS Environmental Management Program is currently being pursued under the authority of the FY 1985 Supplemental Appropriations Act, P.L. 99-88. In addition, authorizing provisions are contained in both H.R. 6 passed by the House November 13, 1985 and S. 1567 passed by the Senate March 26, 1986. While under the provisions of P.L. 99-88 construction may proceed after May 15 even in the absence of authorizing legislation, the Association is hopeful that Congress will act swiftly on major water resource development legislation. Enactment of authorizing legislation would signal a clear and significant federal commitment to the enhancement and development of both economic and environmental resource values of the Upper Mississippi River.

The UMRS Environmental Management Program contains five primary components:

- habitat enhancement and rehabilitation projects
- recreation projects
- long-term resource monitoring and computerized inventory and analysis
- recreation economics study
- traffic monitoring

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Over 95 percent of the funding authorized in H.R. 6 and S. 1567 would be directed toward the first three program elements which constitute the bulk of the work effort.

The projects and programs embodied in the UMRS-EMP are designed to combat the on-going environmental degradation of the Upper Mississippi River System. The habitat rehabilitation projects will at various sites throughout the system employ a variety of structural and management approaches to rejuvenate and protect critical backwater areas that are being threatened or in some cases already lost as a result of both natural and human-induced causes. The recreation projects will provide a diversity of opportunities for river-based recreational experiences. And the long-term resource monitoring program in conjunction with a computerized inventory and analysis system will provide both federal and state resource managers with an enhanced understanding of the complex interdependencies of the system and will greatly facilitate wise future management decisions.

The Upper Mississippi River System historically has had two Congressional mandates. As a nationally significant ecosystem it has been designated as a national wildlife refuge. As a nationally significant commercial transportation system it is managed as a commercial navigation project. The viability of this system requires a commitment to maintain and enhance all aspects. Congress has wisely maintained a balanced resource management approach in the pending authorizing legislation by providing for the construction of a second lock at Lock and Dam 26 and simultaneously authorizing major environmental and recreation programs for the Upper Mississippi River System. Furthermore, the Conference Committee report on P.L. 99-88 articulates Congressional intent that "initial planning and design of the navigation and environmental improvements are to be undertaken simultaneously on equal fiscal footing, to the extent practicable and engineeringly feasible." The Association does not suggest that this language reflects a strict dollar for dollar obligation. However, it certainly reflects a sense of balanced effort and reaffirms a commitment to both programs in the budgetary process.

The member states of the Association recognize the challenge of controlling federal expenditures. It is important, however, for the federal government to back its commitment to authorized projects with the financial means to implement them. The states have already indicated their willingness and ability to share the costs of these projects. The Governors, or Governor's representative, of each of the five states have signed letters of assurance as an expression of their intent to cooperate and cost-share with the federal government. The states view this program as a cooperative venture and, in that spirit of partnership, seek a federal financial commitment.

The UMRS Environmental Management Program has been laid out as a 10 year effort requiring an evaluation report to Congress at the end of that time period. To realize the benefits of the program and carry out the Congressional commitment to balanced management, sufficient funds must be made available in the early years. The program should not be handicapped from the outset if measurable progress is to be demonstrated in future years.

In conclusion, the Upper Mississippi River Basin Association supports the inclusion of funds in the FY 1987 Appropriations bill for the UMRS Environmental Management Program. This action would signal the clear commitment of Congress to balanced multi-purpose management of the Upper Mississippi River System.

Mr. HARRISON. I am Jim Harrison, Executive Director of the Minnesota-Wisconsin Boundary Area Commission. I am happy to be before your committee again.

The commission is in its 20th year of analyzing public policies and programs on the Upper Mississippi and St. Croix River. Our ten citizen commissioners, appointed by the governors, have deliberated and participated for at least the last 13 years in the ambitious and complex process of reformulating a multipurpose plan for the Upper Mississippi River System. Our recommendations on the fiscal year 1987 budget of the Corps of Engineers for the Upper Mississippi River improvements are reflective of the strong and knowledgeable interest and concern of the general public in our region for the wise use, development and protection of this great national river.

Over the years, we have been most grateful for the interest, wisdom and support of the Congress in reordering the Federal priorities and balancing the national objectives on the Upper Mississippi. The initiative was really taken by this subcommittee in 1974 when it approved the first appropriation for what was to become the Great River Study on the river. This unprecedented, cooperative planning program is where our five basin states and the many Federal agencies first learned how to devise a modern-day, cost-effective action plan for balanced river resource management.

Now the final step in fulfilling that long-needed goal is being taken through the measures outlined in the Corps' general plan for the Upper Mississippi River System Environmental Management Program (UMRS-EMP), which is patterned after the Congressionally-mandated comprehensive master plan for the management of the Upper Mississippi River System, commonly known as the UMRS master plan.

These strategic plans, while they may be produced under different authorities with different scopes of work and at different times, are all products of cooperative effort by the same agencies and states with strong public input. They build on one another very effectively. The success of one program is dependent on the execution of other programs in this continuum. We feel this is a prudent, responsible way to develop such a complex strategic plan for such a large and complex resource, by demonstrating the validity of one element before attempting another.

The timing of the committee's decision on the level of funding for the next action level on the Upper Mississippi is critical. The process leading to construction of the second lock at Lock and Dam 26 at Alton, Illinois, is in motion. The appropriation request of $2 million, in general funds, for advance work on that project is reasonable, in and of itself, but the recommended $1 million for the environmental measures in fiscal year 1987 is woefully inadequate. Now that the general plan is available justifying a $3.95 million appropriation for fiscal year 1987—and, by the way, you will see you have copies of this available to your subcommittee—it is only reasonable to maintain the continuity of the years of pilot projects, studies and negotiations that brought about the settlement of the hard-fought disputes over balanced river management on the Upper Mississippi.

Public expectations and hopes are very high on this program now. The process for resolution of the former impasse over Lock and Dam 26 has worked. In keeping with that, we respectfully urge the committee to recommend an appropriation of $3.95 million for the UMRS-EMP for fiscal year 1987. If, for some reason, it is the decision of the committee not to do so, we implore you to act in concert with the established principle of "equal fiscal footing" on the second lock and environmental projects cited in Public Law 99-88 and maintain the proper balance on both sides over the ten-year life of this program.

Thank you very much.

[The statement of James M. Harrison follows:]

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TESTIMONY OF MINNESOTA-WISCONSIN BOUNDARY AREA COMMISSION
ON CORPS OF ENGINEERS FY 1987 BUDGET FOR
UPPER MISSISSIPPI RIVER APPROPRIATIONS

ENERGY AND WATER DEVELOPMENT SUBCOMMITTEE ON APPROPRIATIONS
U. S. HOUSE OF REPRESENTATIVES
APRIL 10, 1986

Presented by James M. Harrison, Executive Director

Summary of Request

Project: Upper Mississippi River System Environmental Management Program, IL, IA, MN, MO, WI. (UMRS-EMP)

The Corps of Engineers has prepared a General Plan for the above program, dated January 1986, which outlines the ten-year action plan for multi-purpose river management on the Upper Mississippi River System. The Administration request for appropriation of $1.0 million in FY 1987 was developed prior to completion of the General Plan.

The correct level of investment in FY 1987 for the UMRS-EMP to attain the goals of the balanced river program mandated by Congress is $3.95 million. This is justified and recommended in the General Plan. It is also consistent with the approach recommended in the Upper Mississippi River System Master Plan and with the strategy adopted by the House and Senate Appropriations Committees in P. L. 99-88 with respect to "Locks and Dam 26, Illinois and Missouri (Second Lock), including environmental management along the Upper Mississippi River Basin."

It is requested that the Committee on Appropriations update the FY 1987 appropriation for the UMRS-EMP from the preliminary level of $1.0 million to the recommended action level of the Corps' General Plan of $3.95 million.

Rationale for Request

The Minnesota-Wisconsin Boundary Area Commission is in its 20th year of analyzing and coordinating public policies and programs on the Upper Mississippi and St. Croix Rivers for its two sponsor States. Our ten citizen Commissioners, appointed by the governors, have deliberated and participated for at least the last 13 years in the ambitious and complex process of reformulating a multi-purpose plan for the Upper Mississippi River System. Our recommendations on the FY 1987 Budget of the Corps of Engineers for Upper Mississippi River improvements are reflective of the strong and knowledgeable interest

and concern of the general public in our region for the wise use, development and protection of this great National River.

Over the years, we have been most grateful for the interest, wisdom and support of the Congress in reordering the Federal priorities and balancing the national objectives on the Upper Mississippi. The initiative was really taken by this subcommittee in 1974 when it approved the first appropriation for what was to become the GREAT River Study on the river. This unprecedented, cooperative planning program is where our five basin States and the many federal agencies first learned how to devise a modern-day, cost-effective action plan for balanced river resource management. Now the final step in fulfilling that long-needed goal is being taken through the measures outlined in the Corps' General Plan for the Upper Mississippi River System Environmental Management Program (UMRS-EMP), which is patterned after the Congressionally-mandated Comprehensive Master Plan for the Management of the Upper Mississippi River System (commonly know as the UMRS Master Plan).

These strategic plans, while they may be produced under different authorities with different scopes of work and at different times, are all products of cooperative effort by the same agencies and States with strong public input. They build on one another very effectively. The success of one program is dependent on the execution of other programs in this continuum. We feel this is a prudent, responsible way to develop such a complex strategic plan for such a large and complex resource, by demonstrating the validity of one element before attempting another.

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Public expectations and hopes are very high on this program now. The process for resolution of the former impasse over Lock and Dam 26 has worked. In keeping with that, we respectfully urge the Committee to recommend an appropriation of $3.95 million for the UMRS-EMP for FY 1987. If, for some reason, it is the decision of the Committee not to do so, we implore you to act in concert with the established principle of "equal fiscal footing" on the second lock and environmental projects cited in P. L. 99-88 and maintain the proper balance on both sides over the ten year life of this program. Thank you.

Mr. BEVILL. Thank you. We will stand in recess temporarily so our good friend, Congressman Gunderson, can go and vote.

Mr. GUNDERSON. Would you like us to come back for questions?

Mr. BEVILL. There won't be any questions.

THURSDAY, APRIL 10, 1986.

ILLINOIS PROJECTS

WITNESS

HON. JOHN E. PORTER, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF ILLINOIS

Mr. MYERS [presiding]. The committee will come to order.

We welcome our colleague on the Appropriations Committee, the gentleman from Illinois, Mr. Porter.

Congressman Porter, you may proceed.

Mr. PORTER. Thank you, Mr. Chairman. I appreciate the opportunity to testify before the subcommittee this morning.

I am appearing before you this morning primarily in support of a very important Army Corps of Engineers project in my district: the North Branch of the Chicago River Flood Control Project. In addition, I am here to ask that this committee support the President's budget request for Waukegan Harbor Maintenance in Waukegan, Illinois. Finally, I ask that the committee support completion of action on an erosion study at the Illinois Beach State Park.

The President's budget does not include a request for the completion of the design and engineering phase for the North Branch project. This project consists of the construction of three retention reservoirs to serve several communities in my district that have experienced serious flooding problems in recent years. I can personally attest to the severity of the problem, as my campaign office in 1982 was devastated by five feet of water. That same year, the Village of Deerfield, Illinois sustained personal property losses totaling nearly $6 million as a result of the same flooding incident. The cost of the two retention basins which would serve Deerfield is estimated at $8 million. $230,000 is needed by the Corps to complete design and engineering, the final phase before construction. Authorization for this project is contained in both the House and Senate versions of the Water Resources bill. In my view, the North Branch project is the highest priority in the 10th Congressional District at the current time and would definitely serve an urgent need. It is very important that this project be constructed as soon as possible.

I am sensitive to the fiscal restraints that this committee, and others, will be operating under this year. Nevertheless, I strongly believe that North Branch is needed and would prove cost effective. I should also point out that the 10th Congressional District receives very little in public works funds in proportion to the amount it sends to the Treasury in taxes.

I would also urge this committee to support the request for $1,195,000 for maintenance of Waukegan Harbor. These funds, which have been provided by this committee the past two years, will be used for maintenance of the Federal harbor breakwater,

shore connection, north and south piers, and channel. Annual traffic in the harbor averaged 396,967 tons for the ten-year period ending in 1982. These are important activities, and I urge your support.

Finally, I am told that the study on erosion control at the Illinois Beach State Park has been completed but is stalled at the district level. I request that the committee include a directive in the bill for the Corps to send the study through the normal review channels. I would further ask that the committee apply such funds as may be needed to complete this review.

I appreciate the opportunity to testify before you and appreciate your consideration of these important requests.

Mr. MYERS. Thank you for your testimony. The committee, as usual, would be glad to work with you later on.

Is there anyone who would care to testify at this time? I think we have to wait a minute. Mr. Carson wants to be here.

[Recess.]

Mr. MYERS. The committee will stand in recess until floor activity permits us to reconvene.

THURSDAY, APRIL 10, 1986.

ARC PROGRAMS

WITNESS

HON. HENRY J. NOWAK, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF NEW YORK

Mr. BEVILL. The committee will come to order. We are pleased to have our good friend and colleague, Congressman Henry Nowak here, and you had to postpone your flight again but we will be glad to hear from you now. We will make your prepared statement a part of the record. You may proceed as you wish.

Mr. NOWAK. Thank you very much, Mr. Chairman. I am sure it will be worth missing a flight to appear before your committee.

I am here to appeal, once again, for your continued support of the Appalachian Governors finish-up programs and to ask that funds be provided for fiscal year 1987. Jim Howard, chairman of our full committee, concurs with my remarks.

The President's budget for fiscal year 1987 again calls for termination of the Appalachian Regional Commission and the programs authorized by the Appalachian Regional Development Act. It is basically the same budget recommendation he has made each year since he has been in office. However, the Congress, thanks in large part, Mr. Chairman, to you and your committee, has wisely supported the Appalachian Governors finish-up program at reduced appropriation levels.

The President also has recommended rescinding $81 million of the $122.2 million fiscal year 1986 appropriations. In addition, $5.255 million was sequestered under the Gramm-Rudman-Hollings provisions.

We continue to strongly resist administration efforts to terminate the programs or to rescind funds before the work of the commission is completed, despite the urgency of reducing the budget

deficit. We believe it would be an imprudent and wasteful use of funds already invested to abruptly terminate the programs rather than bringing them to an orderly completion, because much of the value of the investments made thus far would be severely reduced.

The Congress, being aware of this, has consistently voted to support the orderly completion of the program. Members of the House in the 97th, 98th and 99th Congresses, have demonstrated overwhelming bipartisan support for H.R. 10, Title II of which would provide for construction of the highway corridor system as well as assistance for area development.

During the twenty-plus years of the Appalachian Regional Commission's existence, it has stimulated dramatic progress in the region. Poverty rates have come down considerably, the highway corridor system has opened up the region, more than 1.5 million jobs have been created, income levels have moved closer to national averages, outmigration has been turned around, and health care and educational levels have improved as has the status of housing, and water and sewer systems.

Although much more needs to be done, particularly in the poorest counties, and the Appalachian region still lags behind national averages, the overall standard of living has increased and there is a brighter outlook for the future.

[The statement of Mr. Nowak follows:]

STATEMENT OF THE HON. HENRY J. NOWAK, CHAIRMAN
SUBCOMMITTEE ON ECONOMIC DEVELOPMENT
COMMITTEE ON PUBLIC WORKS AND TRANSPORTATION

BEFORE THE SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT
COMMITTEE ON APPROPRIATIONS

Thursday, April 10, 1986

Mr. Chairman, Members of the Committee, I am here to appeal, once again, for your continued support of the Appalachian Governors finish-up programs and to ask that funds be provided for FY 1987. Jim Howard, Chairman of our full Committee, concurs with my remarks.

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During the twenty-plus years of the Appalachian Regional Commission's existence, it has stimulated dramatic progress in the Region. Poverty rates have come down considerably, the highway corridor system has opened up the Region, more than 1.5 million jobs have been created, income levels have moved closer to national averages, outmigration has been turned around, and health care and educational levels have improved as has the status of housing, and water and sewer systems. Although much more needs to be done, particularly in the poorest counties, and the Appalachian Region still lags behind national averages, the overall standard of living has increased and there is a brighter outlook for the future.

In the last few years, national and worldwide economic events have hit this Region especially hard. The recession of the early 1980's combined with the Nation's high trade deficit which drastically affected the competitiveness of Appalachian industries, and the reduction in Federal spending for programs designed to help the area's economy resulted in a major setback for Appalachia. It is, however, a tribute to the economic structures developed in those States over many years, with strong assistance from the Commission, that the Region, though down, is not out and is working hard and innovatively to accommodate to the economic realities of this decade.

The finish-up program is zeroing in on specific needs in the area, on completing essential segments of the highway system, on stimulating regional private investment and entrepreneurial activity, on training and retraining area residents to handle new kinds of jobs, and on providing basic services for the Region's poorest counties.

Based on regular appropriations, the Commission is currently operating on only about one-third the amount of Federal funds it received in 1979 and 1980, the last two years under President Carter. Based on the $116.9 million figure after the Gramm-Rudman-Hollings sequestration, it is a bit less than one-third.

Now is not the time to cut off Federal assistance to Appalachia, or to cut back funding to a point where the viability of the Commission is rendered inadequate for the programs to function. The need for these programs is as great now as it ever was, perhaps more so.

Just as we are becoming more aware, in this Nation, of world interrelationships and interdependencies and that our competition in international markets is gaining strength, so must we realize that, as a Nation of regions each with different resources, we cannot ignore our own regional interdependencies if we are to compete effectively in world markets. We cannot afford economically to turn our backs on areas with potential, nor can we afford to waste our human, economic or natural resources. We must invest in ourselves for the good of our overall National economy.

Mr. Chairman, the concern that you and your Committee have shown for this distressed area and your efforts to continue funding this excellent public/private partnership have been very much appreicated.

I hope that you will continue the understanding and support you have shown over the years and provide the funding necessary to keep the Appalachian Governors finish-up program going in a viable manner so that the Region and the Nation may benefit from its valuable investments.

Mr. BEVILL. Thank you for a very fine statement. Certainly this committee supports your views and the Governors' views. We hope we can continue to support the Governor's at least to the completion of these projects that are underway. We do expect the rescission will expire next Tuesday. Unless some other obstacle is thrown in our way, the 1986 funding should be available for these projects that are very necessary to the Appalachian Region of the country. Thank you very much.

Mr. NOWAK. Thank you, Mr. Chairman.

THURSDAY, APRIL 10, 1986.

FLORIDA PROJECTS

WITNESS

HON. BILL NELSON, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF FLORIDA

Mr. BEVILL. Next, we have our good friend and colleague Congressman Bill Nelson, who I am sure can testify. It is 1:30 Bill, and we are sorry we are running five minutes late. You have got a hearing that you are going to be presiding over, so we will be glad to hear you.

Mr. NELSON. Mr. Chairman, I told you I would take less than a minute and I intend to, so you tell me when to punch off the stopwatch.

Well, I am just going to tell you simply, Mr. Chairman, that there have been two beach renourishment programs that we have been working with you on for several years. One of them goes way back to 1983; you appropriated some money for a study that got through the Senate as well. This is in my home county of Brevard.

We were going from the reconnaissance and the feasibility study and, lo and behold, the Corps inadvertently dropped it after you had appropriated it. We started raising the question with the Corps. They got back and finally got around to doing the reconnaissance study.

It is ready to go to the feasibility study. All my local sponsors are lined up ready to go. I would ask that you put that in.

Mr. BEVILL. All you need is money?

Mr. NELSON. All we need is a few little piddling dollars to go on with this feasibility study, on a beach that really gets hit pretty hard. Last Thanksgiving, a northeastern storm really chewed it up and there were pictures of this beach and of the next one I am about to tell you a little further south down at Vero Beach, pictures that hit the AP and UPI wins all over because there was some rather extraordinary erosion. The second one, that will be the last that I will speak to you on, because everything is in the record here.

Mr. BEVILL. Until next year.

Mr. NELSON. Well, I probably won't even have to come back to you; you will have it all taken care of, and I won't have to testify then.

Mr. BEVILL. You got that in the record.

Mr. NELSON. The second one is ready to go on the construction. They have been through all the planning and engineering. They have got their local sponsors lined up and they are ready to go. It was the worst hit of all the beaches. I mean, houses were about to fall in, and so forth. They have done a lot of patchwork down there locally. It needs the beach renourishment project. That is the Indian River County project near Vero Beach, Florida.

Mr. BEVILL. How many few dollars?

Mr. NELSON. On that particular one, the construction is something like $2 million, the federal share. Then the local share picks up, the same thing, 50 percent; fifty federal and 50 State and local.

[The statement of Mr. Nelson follows:]

CONGRESSMAN BILL NELSON

Testimony before

Subcommittee on Energy and Water Development
House Committee on Appropriations

April 10, 1986

Mr. Chairman, because of your foresight, we seem finally to have the West Turning Basin at Port Canaveral on line. For the second year in a row -- the Administration has finally seen the light -- they have requested construction funding for this project. If you had not nudged them in this direction three years ago, we would never be able to tout the successes at Port Canaveral today. I just want to take the opportunity today the endorse the President's recommendation for Port Canaveral in FY 1987 so that we may continue this project so important to the economy of Central Florida.

We have some progress in the two beach projects in my district since last year. Brevard County Beach was in the middle of its reconnaissance study this time last year. At the end of 1985, this study was completed and the project is now ready to proceed on to the feasibility phase.

Originally, your subcommittee funded the entire study phase of this project in the FY 1983 Supplemental Appropriations bill. Your endorsement was reinforced by the Senate, which also included the appropriate language in its report. However, the Corps inadvertantly dropped this program and it did not commence until much later in FY 1984. Since that time, we have had several severe storms which have resulted in more damage to the already deteriorating beaches. My State and local sponsors are standing by -- ready and willing -- to pay their fair share in order to advance this important project.

I understand how tenuous the funding will be this year with all of the constraints, but I would urge that this project be included in the FY 1987 Appropriations bill to preclude further delays and loss of more valuable property.

The second renourishment project of concern is the one in Indian River County, Florida. This one has completed all of the necessary studies and planning and engineering and has been awaiting the authorization for construction. The language for this project has been included in both the House and the Senate versions of the Water Resources Authorization bill. As you are well aware, we have been waiting for many years for the enactment of such an authorization bill. I would like to request that funding for Indian River Beach be included in the upcoming fiscal year appropriations for the construction phase. I am hopeful that the conference for this completed before the appropriations, but ask that appropriations be long-overdue authorization can be included, regardless -- since the authorization was contained in both the House-passed and the Senate-passed versions and will not even be a conference issue.

The beaches of Indian River County probably suffered the worst damage on the East Coast of Florida from the freak Thanksgiving northeaster a year and a half ago. The dune line was destroyed in a number of areas and a number of roads and private structures were severely damaged or destroyed. Additional delays will further endanger these areas.

In the area of energy -- the top priority of the Nation's nuclear physicists -- the Continuous Electron Beam Accelerator Facility (CEBAF) -- was recently authorized at a $17 million level by Science and Technology's Energy Development and Applications Subcommittee. The CEBAF is the centerpiece project of the Southeastern University Research Association (SURA) -- of which Florida Institute of Technology -- in my congressional district -- and three other state institutions -- Florida State University,

University of Florida, and the University of Miami -- are members.

In 1983, a Department of Energy national competition selected SURA's proposal for a continuous electron beam accelerator facility. CEBAF, once approved by Congress, would bring a $236 million nuclear physics construction project to the region by 1992. The 250 full-time employees planned for the facility represent a significant addition to the area's scientific manpower base. Thirty-nine new CEBAF-related physics professorships at SURA institutions will further enhance the research environment while improving educational opportunities for graduate students. And visiting scientists from around the Nation and the world will bring additional intellectual benefits as they carry out their experiments.

Already $4.6 million and many man-years of effort have been channeled by the region's universities into the project and the proposed SURANet supercomputer network. New research facilities like CEBAF play a crucial role in preserving America's technological edge. I urge your Subcommittee to support the authorizing subcommittee's request for this forward looking project.

Last year the House Science and Technology Committee recommended the establishment of a national effort in passive cooling similar to our past efforts in solar heating. A five year program was detailed and funding of $1 million was identified as necessary. This subcommittee concurred with that assessment as did the Senate. The recommended funding for FY 1987 was to be $1.4 million. However, in light of the budget restrictions, I would recommend a Phase 2 level of $900,000 or about 10% less than the FY 1986 appropriated level, for the cooling work to continue to address hot, humid climate issues for single and multi-family residences.

With the continuing growth in the Sun Belt, this work provides significant energy information for our home building industry.

Over the past two years, the States of Florida and Hawaii have established a closely integrated program of research on open-cycle ocean thermal energy conversion. Based on the 1984 Office of Technology Assessment Review, a 165 KWE proof of principle experiment was recommended. This subcommittee has supported that multi-year effort through funding levels higher than the Administration's inadequate requests. I urge you to continue that support and believe that $4.2 million as authorized by Science and Technology's Energy Development and Applications Subcommittee (15% less that last year) represents the minimum effective program level. This work should continue the phased approach for the 165 KWE experiment as outlined by the Science and Technology Committee.

As always, Mr. Chairman, I am indebted to you for your kindnesses to me and to the Eleventh District of Florida. Thank you for giving me this opportunity today.

# # # # #

Mr. BEVILL. We certainly hope we can accommodate you. We will work with you and do the best we can.

Mr. NELSON. I appreciate that.

Mr. BEVILL. Any questions?

Thank you.

THURSDAY, APRIL 10, 1986.

NARROWS UNIT

WITNESSES

HON. HANK BROWN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF COLORADO

GARY FRIEHAUF, SECRETARY-MANAGER, LOWER SOUTH PLATTE WATER CONSERVANCY DISTRICT

C. STEVE TREADWAY, PRESIDENT, LOWER SOUTH PLATTE WATER CONSERVANCY DISTRICT, BRUSH, CO

BEN G. WEITZEL, DIRECTOR, LOWER SOUTH PLATTE WATER CONSERVANCY DISTRICT

Mr. BEVILL. Our good friend and colleague Congressman Hank Brown is here. Hank, we are always delighted to hear from you and hear what you have to say. Your formal statement will be made part of the record and we will be glad to turn it over to you.

Mr. BROWN. Thank you, Mr. Chairman. With your permission, I would like to introduce some of the folks joining us today.

Mr. BEVILL. All right.

Mr. BROWN. Mr. Steve Treadway is President of the Lower South Platte Water Conservancy District, Brush, Colorado; Mr. Ben Weitzel, Director, as well as Gary Friehauf, who is Secretary-Manager.

Mr. BEVILL. We are pleased to have all three of you.

Mr. BROWN. We have some folks as well from Nebraska. Bob Weitzel, of course, is the attorney that is working with the district, who is in the back, and let's see, Kenneth Miller is here—and Cliff Wells—these are the folks downriver from us that we think will benefit from the construction of the dam when it is completed.

Mr. Chairman, because the Statement is in the record, I would summarize very briefly. The Narrows project was first authorized in 1792 or shortly thereafter.

[The statement of Mr. Brown follows:]

STATEMENT OF

HONORABLE HANK BROWN

OF

COLORADO

BEFORE THE SUBCOMMITTEE ON ENERGY AND WATER

DEVELOPMENT

HOUSE APPROPRIATIONS COMMITTEE

APRIL 10, 1986

Mr. Chairman, I appreciate having the opportunity to submit a statement.

The Narrows Project, which is located in northeastern Colorado, was authorized in ~~1940~~ 1944 and reauthorized in 1970. This committee has been very supportive of the project as well, and in the early 1970s appropriated funds for it on a regular basis. As you are aware, activity was suspended seven years later when western water project funding was stopped by President Carter.

Mr. Chairman, pre-construction activity was initiated by the Bureau of Reclamation in response to your report in the FY 1982 appropriation bill. In that year, $500,000 was expended for pre-construction activity. In FY 1983, an additional $500,000 was appropriated. In FY 1984, the House passed H.R. 3958, a supplemental appropriations bill for water resource

development, containing construction funding for the Narrows. The bill was reintroduced and passed by the House for supplemental appropriations for FY 1985. Unfortunately, in both instances, the other body did not concur. In FY 1986, funding of $500,000 was approved for studies related to wildlife habitat. Those studies are nearly completed now. Mr. Chairman, I urge the committee to approve funding in FY 1987 for completion of the studies.

Early explorers held out little hope for the productive development of the West. Major Stephen Long who went West in 1819 down the Missouri and South Platte Rivers said, "No one but nomads could exist there. There was no timber or water. The soil was poisoned. The countryside was covered with sand and cactus." The Reclamation Act of 1902 brought forth a "miracle" to the West. In just one year, FY 1983, reclamation projects in the West served a population of over 22 million; had a gross crop value of $7 billion; produced 55.2 million tons of food, fiber, and forage; and generated 55.7 billion kilowatts of electricity. As of September of 1983, the federal investment in completed Reclamation projects totaled $7.8 billion . Approximately 81 percent of this total investment is reimburable to the Federal Treasury.

Mr. Chairman, your committee has been critical in making the reclamation projects a valuable asset to the people that are dependent upon water for their livelihood, and your contribution is appreciated.

Thank you.

WITNESS LIST FOR THE PRESENTATION OF THE LOWER SOUTH PLATTE WATER CONSERVANCY DISTRICT BEFORE THE ENERGY AND WATER DEVELOPMENT SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS OF THE HOUSE OF REPRESENTATIVES OF THE CONGRESS OF THE UNITED STATES IN SUPPORT OF THE NARROWS UNIT, COLORADO

APRIL 10, 1986

Mr. C. Steve Treadway, President for the Lower South Platte Water Conservancy District, Brush, Colorado; Mr. Ben G. Weitzel, Director for the Lower South Platte Water Conservancy District, Brush, Colorado; and Mr. Gary R. Friehauf, Secretary-Manager for the Lower South Platte Water Conservancy District, Sterling, Colorado.

LOWER SOUTH PLATTE WATER CONSERVANCY DISTRICT
211½ MAIN STREET / P.O. BOX 1725 / STERLING, COLORADO 80751 / PHONE 522-1378

STATEMENT OF THE LOWER SOUTH PLATTE WATER CONSERVANCY DISTRICT
PRESENTED BEFORE THE ENERGY AND WATER DEVELOPMENT SUBCOMMITTEE
OF THE COMMITTEE ON APPROPRIATIONS OF THE HOUSE OF REPRESENTATIVES
OF THE CONGRESS OF THE UNITED STATES IN SUPPORT OF THE
NARROWS UNIT, COLORADO

April 10, 1986

The Lower South Platte Water Conservancy District the local sponsoring and contracting entity for the Narrows Unit Colorado, submits the following testimony to demonstrate its continued support for construction of the Narrows Unit of the Missouri Basin Project, as authorized on August 28, 1970, by an act of Congress (Public Law 91-389) and request for inclusion of $5,000,000 in the FY-1987 Energy and Water Development Appropriations Legislation.

Ladies and Gentlemen of the Committee, thank you for granting privilege to Lower South Platte Water Conservancy District representatives to appear before you today, and express their continued support for construction of the Narrows Unit, Colorado. Ten years ago this committee recommended the Congress appropriate $3.995 million for construction activities. July 1986 is the ten year anniversary of the initiation of construction, land acquisition and other activities. We ask that the committee take the initial steps toward history repeating that event.

The Narrows Unit is an element of the Pick Sloan Missouri River Basin Program which was initially authorized in 1944 as a part of the Flood Control Act of the same date. Again it was referenced in the Flood Control Act in 1946. In May 1964 property owners and citizens of a four county area in Northeast Colorado committed themselves to a program which was recognized as a method through which the U.S. Government helped local people in the seventeen western states develop the needed water resources which they were unable to develop with their own resources. Approximately twenty-two years ago these people put into place the institution necessary to provide a contracting entity with the United States for the Narrows Project. For twenty-two years people have been taxing themselves, an effort in good faith, to provide the local institutional entity, necessary for repayment to the United States for irrigation water. The administration is calling for expanded cost-sharing, but their reports do not give credit to the districts and state for the investments made from the voluntary payment of taxes by the local people has been and continues to be an important form of cost-sharing. An effort which here-to-for has not generally been recognized as part of project cost-sharing.

A vast majority of the district resources have been invested in obtaining a water right. This is a critical segment of the project. Without a storage decree, to provide a priority under which water will be stored, the Narrows Unit would have a significantly reduced value. In effect, it would be reduced to a flood control facility only. The water conservancy district has spent significant portions of its funds over the twenty-two years obtaining and maintaining the rights to water under the laws of the State of Colorado.

In May 1986, once again, the conservancy districts will have to file their claim, stating continued interest and listing the work and financial investments made toward perfecting this water right decree, in the court. These activities are a form of "cost-sharing" but the district investments receive little recognition in the accounting of investments in this project. We submit that nowhere in the financial and economic evaluation documents will you find reference given to a value for water rights.

Obtaining a water right is just one of the many activities by the conservancy districts and the local people. Statements of support by the Colorado Legislature through Senate Joint Resolution #6, in 1981, passage of H.B. 1088 in 1985, and again the reference to the Narrows Unit as a priority in proposed legislation before the 1986 legislature are examples of efforts and sharing in the necessary work proceeding physical construction of the Narrows. The issue is, the district invests nearly all its available resources in support of the Narrows project.

Lower South Platte and Central each signed contracts

with the United States in 1976. Central has completed the local contracting activities, and has received court confirmation and validation of the contract with the United States. The Lower South Platte has executed in excess of one hundred local contracts and will complete that process. We have preformed in good faith under the terms of those contracts since the date of execution.

Again, we complement this committee for its valiant efforts in leading the way throughout the years. We remember the presidential veto and action which provided subsequent revenues so the project could proceed to the degree that it has.

One year ago this committee recommended and it was favorably received by Congress to appropriate $500,000 to direct the Bureau of Reclamation to prepare a plan to remove any possible inferences, construction of the Narrows project could have an adverse impact on Endangered Species and their habitat three hundred miles, more or less, down river from the proposed project site. Those planning activities have gone forward. Representatives of three states, Wyoming, Nebraska, and Colorado, representatives of the environmental community, and the Whooping Crane Habitat Management Trust, all, have been involved in this activity. At this particular time the district has been informed that these activities will be completed by October or November 1986.

In light of the district contracting work and the projected completion and favorable resolution of Endangered Species question, we hereby submit a request to this committee to include five million dollars in the F.Y. 1987 appropriation legislation for the purposes of,

a) Land acquisition from willing sellers within the project take area. We ask the Bureau be directed to actively cooperate with landowners to prevent property loss due to financial difficulty, and

b) That the Bureau of Reclamation be directed to initiate the field surveys and to contract for construction design for relocation of Colorado State Highway 144, the Union Pacific Railroad, and other utilities which would lie within the project boundaries, and

c) If this committee deems it essential to the completion of the Narrows Unit, that a greater degree of cost-sharing than already provided for under the law, rules and regulations, we suggest a directive to the Department of Interior on this issue be included with the appropriation. Current cost-sharing provisions includes, P.L. 89-72, and P.L. 93-251, which requires participation by the State for all wildlife enhancement facilities and cost-sharing by the State of Colorado to participate in all recreational facilities. The Reclamation Law provides cost-sharing requirements and guidelines for agriculture and the municipal and industrial water users payments to the United States. Reclamation Law, Title III of the Water Supply Act of 1958, P.L. 89-72, and P.L. 93-251 form the foundation for Narrows project cost-sharing requirements. Presently those requirements for cost-sharing are approximately fifty-five million dollars. In addition, the

Pick Sloan Power Project will repay to the Treasury the outstanding balance of costs allocated to agriculture above the users ability to pay. This could well add an additional amount of $100,000,000 to the package. However, if in addition to these numerious cost-sharing requirements as per the Narrows, August 28, 1970, authorization, further cost-sharing is essentional to an appropriation for construction of the Narrows Unit, we ask this committee direct the Department of Interior enter into and conclude negotiations with local and state agencies.

The request to direct the Department to pursue cost-sharing agreement is made because of uncertainties of changes which are not included within the project authorizing legislation (P.L. 91-389). The State of Colorado believes the Department should proceed with construction of the Narrows project as per the Congressional authorization. The Conservancy Districts concur in this position However, this administration has been stating that they are interested in additional cost-sharing provisions. If additional cost-sharing is essential, then it seems that the responsible department should be responsible to pursue that objective. The Narrows Unit was authorized pursuant to a set of rules, regulations and congressional actions, therefore it is our position that the Narrows Unit should be constructed pursuant to that law. The people of Northeastern Colorado have performed in good faith under that law; believe the United States acting through the Department should perform as well. We realize that Congress can in fact change rules in mid-stream, and if their intent is to change the rules it is our appeal to this committee that any modification or changes in the cost-sharing should result from congressional initiative and be the responsibility of the appropriate federal agency to arrive at an accommodation.

In closing, again we thank you for the opportunity to appear before you today. We submit that the local conservancy districts have performed in good faith over the last twenty-two years and have performed in good faith under the terms and conditions of the contract signed in 1976, by pursuing necessary subcontracts, maintenance of the water rights, and other work necessary for completion of local prerequisite activities. We ask this committee to appropriate $5 million dollars to resume the construction activities of the Narrows Unit-Colorado.

GENTRY RESOURCES CORPORATON
11920 E. MAPLE
AURORA, COLORADO 80012
303-360-5262

MARCH 21, 1986

CONGRESS OF THE UNITED STATES
HOUSE OF REPRESENTATIVES
MR. TOM BEVILL, CHAIRMAN
SUBCOMMITTEE ON ENERGY & WATER DEVELOPMENT
COMMITTEE ON APPROPRIATIONS
WASHINGTON, D.C. 20515

DEAR MR. BEVILL:

I APPRECIATE BEING GIVEN THE OPPORTUNITY TO TESTIFY BEFORE THE ENERGY AND WATER DEVELOPMENT SUBCOMMITTEE ON APPROPRIATIONS, APRIL 10, 1986 AT 11:15 AM. I WAS NOT AWARE THAT WRITTEN TESTIMONY WAS ACCEPTED AND GIVEN THE SAME CONSIDERATION AS AN ORAL TESTIMONY. THEREFORE, AS THE COMMITTEE ENCOURAGES, I AM ENCLOSING FIFTEEN COPIES OF MY WRITTEN TESTIMONEY FOR THE SUBCOMMITTEE'S REVIEW.

IF THERE ARE ANY QUESTIONS PLEASE CONTACT ME AT THE ABOVE ADDRESS.

VERY TRULY YOURS,

DAROLD E. PROCTOR
PRESIDENT

DEP:JM
ENCLOSURE
CC:HANK BROWN - BILL ARMSTRONG

BEFORE THE ENERGY AND
WATER DEVELOPMENT
SUB COMMITTEE ON
APPROPRIATIONS
UNITED STATES SENATE

MARCH 18, 1986

STATEMENT OF GENTRY)
RESOURCES CORPORATION,)
A COLORDO CORPORATION)

GENTRY RESOURCES CORPORATION (GENTRY) RESPECTFULLY REQUESTS:

1. THAT SPRING CANYON PUMPED STORAGE PROJECT, LAKE MEAD NATIONAL RECREATION AREA, BE DENIED FURTHER FUNDING, UNDER SPONSORSHIP OF THE DEPARTMENT OF THE INTERIOR (DOI), THE BUREAU OF RECLAMATION (BOR), AND WESTERN AREA POWER ADMINISTRATION (WAPA) AND THE DEPARTMENT OF ENERGY.

2, THAT THE PUBLIC UTILITY REGULATORY POLICIES ACT OF 1978, (PURPA) 16 U.S.C. 2601-2645, BE RETAINED IN ITS PRESENT FORM AND WITH NO CONGRESSIONAL MANDATED CHANGES IN THE REGULATORY LAW IMPLEMENTING THE SAME.

3. THAT CONSIDERATION BE GIVEN TO ENACTMENTS CLARIFYING THE RESPECTIVE POWERS, AUTHORITY AND RESPONSIBILITIES OF THE FEDERAL ENERGY REGULATORY COMMISSION (FERC), THE DOI, THE BOR, AND DEPARTMENT OF ENERGY, AND ELIMINATING DISCREPANCIES AND CONFLICTS IN THE FEDERAL REGULATION OF HYDROELECTRIC DEVELOPMENTS BY PRIVATE ENTERPRISE OR NON-FEDERAL INTERESTS.

4. THAT THE EXCLUSION OF THE LAKE MEAD AREA FROM PROVISIONS OF THE FEDERAL POWER ACT, COLORADO RIVER BASIN PROJECT ACT, 43 U.S.C. §1555, P.L.90-537 §605,BE RESCINDED.

REASONS FOR REQUESTS

1 A. GENTRY ASSERTS THAT THE DOI AND BOR PROMULGATED, PLANNED, AND OTHERWISE SPONSORED THE SPRING CANYON PUMPED STORAGE PROJECT COMMENCING ON OR ABOUT MAY, 1984, AND CONTINUING TO PRESENT DATE, IN CONTRAVENTION AND IN DEROGATION OF THE EXPRESS CONGRESSIONAL MANDATE SET OUT IN THE DEPARTMENT OF ENERGY ORGANIZATION ACT OF 1977, P.L.95-91, 42 U.S.C. §§7152 (a)(E), THAT THE POWER MARKETING FUNCTIONS OF THE BOR BE TRANSFERRED FORTHWITH TO THE SECRETARY OF THE DEPARTMENT OF ENERGY, AND ALL OTHER FUNCTIONS OF THE DOI WITH RESPECT TO SUCH ACTIVITY. THE ACTIVITIES OF THE BOR DIRECTLY RELATE TO PLANNING OF THE MARKETING OF ELECTRIC POWER USING WATER FROM LAKE MEAD, AND ARE VIOLATIVE OF THE OFFICIAL POLICY STATED BY CONGRESS IN THE ACT AT 42 U.S.C. §7112 THAT THE DEPARTMENT OF ENERGY SHALL BE RESPONSIBLE FOR AND CARRY OUT PLANNING, COORDINATION, DEVELOPMENT AND IMPLEMENTATION OF ENERGY PRODUCTION, AND IN SENATE REPORT NO. 164 ON P.L.95-91 WHICH STATES "IT IS THE PURPOSE OF THIS LEGISLATION TO CONSOLIDATE INTO ONE DEPARTMENT THE SUPPLY DEVELOPMENT RESPONSIBILITIES WITH RESPECT TO ENERGY (INCLUDING ELECTRIC POWER SUPPLY)".

1 B. THE BOR WERE THE INITIATING GOVERNMENT AGENCY OF THE SPRING CANYON PROJECT, AND WERE IN SUCH ORIGINATING POSITION AT LEAST ONE YEAR PRIOR TO THE ENTRY OF WESTERN AREA POWER ADMINISTRATION (WAPA) INTO THE PROGRAM, AND AT PRESENT WAPA IS THE APPARENT SPONSORING AGENCY. HAVING APPOINTED THE BOR AS PROJECT MANAGER IN JULY 1985, OR THEREABOUT. THIS ACTION BY WAPA IS NOT ABOVE CRITICISIM IN LIGHT OF THE PREVAILING CONGRESSIONAL MANDATE ON SEPARATION OF AGENCY FUNCTIONS.

1 C. GENTRY IS THE FIRST AND ONLY NON-FEDERAL APPLICANT (INSOFAR AS IS KNOWN TO GENTRY) FOR PRELIMINARY PERMIT TO UTILIZE WATER FROM LAKE MEAD, UNDER ITS APPLICATION FOR BLACK MOUNTAIN PROJECT, FERC PROJECT NO. 7519-000. GENTRY HAS BEEN ISSUED PRELIMINARY PERMIT FOR FEASIBILITY PROCESSING ON ITS LAKE PLEASANT PROJECT, FERC PROJECT NO. 7587-000, IN MARICOPA COUNTY, ARIZONA. GENTRY HAS ENGAGED IN RATHER EXTENSIVE NEGOTIATIONS WITH MOST MAJOR UTILITIES IN SOUTHERN CALIFORNIA, ARIZONA AND NEW MEXICO TO FURTHER ITS DEVELOPMENT OF LAKE PLEASANT PROJECT, BUT AT THE SAME TIME ANTICIPATING A POSSIBLE ISSUANCE OF PERMIT ON ITS BLACK MOUNTAIN PROJECT. THE BOR HAS DIRECTLY COMPETED WITH GENTRY BY SIGNING UP THE VERY SAME UTILITIES FOR PARTICIPATION IN CONSTRUCTION AND OWNERSHIP OF ITS SPRING CANYON PROJECT ON LAKE MEAD. THIS VIOLATES THE PRINCIPLE OF ALLOWING PRIVATE ENTERPRISE TO ENGAGE IN HYDRO POWER DEVELOPMENT, BY SUBSTANTIALLY HAMPERING GENTRY IN ITS NEGOTIATIONS WITH SUCH UTILITIES. IT SEEMS THAT THE BOR ONLY HONORS THIS PRINCIPLE IF IT CHOOSES THE PLAYERS OR PARTICIPANTS IN SUCH PROJECTS.

1 D. THE DOI HAS ASSERTED IN REGARD TO THE IMPLEMENTATION OF GENTRY'S PERMIT ON THE WARM CREEK PROJECT FERC PROJECT NO 7585-000 (LAKE POWELL) THAT FERC LACKS AUTHORITY TO GRANT FEASIBILITY STUDY PERMITS OR LICENSES ON LANDS WITHIN NATIONAL RECREATION AREAS, WHEREAS THE ORIGINAL AND STILL IN EFFECT APPLICABLE CONGRESSIONAL LAW IS THAT WITHOUT FURTHER CONGRESSIONAL AUTHORIZATION, FERC HAS NO AUTHORITY TO GRANT HYDROELECTRIC DEVELOPMENT PERMITS OR LICENSES IN NATIONAL PARKS AND NATIONAL MONUMENTS ONLY, AND THE PROPER CONCLUSION IS THAT ALL OTHER COMPONENTS OF THE NATIONAL PARK SYSTEM ARE SUBJECT TO THE FEDERAL POWER ACT AND FERC ACTIVITIES. THIS IS AN ATTEMPT BY DOI TO MAKE NEW LAW, AND CONTRADICTS THE AUTHORITY OF FERC UNDER THE FEDERAL POWER ACT. NOT ONLY IS THIS AN ATTEMPT TO STRAIN THE LAW TO THE PARTICULAR PURPOSES OF THE DOI, BUT IS A VIOLATION OF THE CONSTITUTIONAL RIGHTS OF GENTRY UNDER EQUAL PROTECTION OF THE LAWS PRINCIPLES IN LIGHT OF THE FACT THAT THE SPRING CANYON PROJECT OF THE BOR IS IN THE SAME POSITION OF VIOLATING THE PURPOSES OF THE NATIONAL PARK SYSTEM BY INVOLVING LANDS WITH A NATIONAL RECREATIONAL AREA. IN ALL FAIRNESS IF GENTRY IS DENIED SUCH ACTIVITY, SO

SHOULD THE BOR AND DOI BE SIMILARLY DENIED SUCH ACTIVITY.

1 E. THE REQUESTS BY DOI AND BOR FOR CONGRESSIONAL APPROPRIATIONS ARE A PERFECT SYSTEM FOR SEEKING "ABSOLUTION" AND CURE OF THEIR UNWARRANTED ACTIVITIES IN PLANNING AND PROMULGATING THE SPRING CANYON PROJECT. FOR THIS REASON ALONE, CONGRESS SHOULD DENY THE REQUESTS FOR ANY FURTHER FUNDING OF SPRING CANYON PROJECT OR ANY ACTIVITIES CONNECTED THEREWITH.

1 F. INFORMATION AVAILABLE TO GENTRY INDICATES THAT THE PROPOSED SPRING CANYON PROJECT WILL NOT BE COST EFFECTIVE AND WILL CHARGE HIGHER RATES TO THE SAME SERVICE AREAS THAN GENTRY'S LAKE PLEASANT PROJECT CAN PROVIDE, ON A RATIO OF $1399 MW CONSTRUCTION COSTS FOR SPRING CANYON PROJECT TO $831 KW FOR LAKE PLEASANT PROJECT IN 1985 DOLLARS. THIS IS A VERY DISPARATE PROJECTION. ADDITIONALLY, IF THE UTILITIES PAY 100% OF THE CONSTRUCTION COSTS OF SPRING CANYON PROJECT UNDER PRESENT PLAN, THE QUESTION ARISES AS TO WHY SHOULD THE GOVERNMENT PAY THE PLANNING AND ENGINEERING COSTS FOR THE UTILITIES WHICH ARE FULLY ABLE TO DO THIS FOR THEMSELVES.

1 G. THE COMPLETION OF SPRING CANYON PROJECT WILL STRENGTHEN THE CAUSE OF GENTRY IN ASSERTING IN THE COURTS WHATEVER RIGHTS IT HAS TO CLAIM DAMAGES OR OTHER RELIEF AGAINST RESPONSIBLE GOVERNMENT OFFICIALS FOR THEIR UNWARRANTED ACTIONS AGAINST GENTRY.

2. GENTRY MAY BE FORCED TO UTILIZE THE BENEFITS OF THE PURPA LAW TO AVOID A LOSS OF ITS TIME AND EXPENSE INVOLVED IN PROMOTING HYDROELECTRIC DEVELOPMENTS UNDER FERC PERMITS AND LICENSES. SHOULD THIS LAW BE REPEALED, OR WEAKENED, GENTRY AND MANY OTHER SMALL PRODUCERS AND ENTREPANEURS WILL BE FORCED OUT.

3. GENTRY, IN THE ROLE OF APPLICANT FOR FERC PRELIMINARY PERMITS TO STUDY FEASIBILITY ON HYDROELECTRIC PROJECTS, AND AS THE HOLDER OF TWO SUCH PERMITS, HAS ENDEAVORED TO FUNCTION UNDER SUCH LEGAL PRIVILEGES OR RIGHTS, BUT HAS BEEN SEVERLY HAMPERED BY THE OPPOSITION OF THE DOI AND ITS AGENCIES. GENTRY IS CAUGHT IN THE MIDDLE OF ARGUMENT BETWEEN FERC AND DOI OVER THE BASIC AUTHORITY OF FERC TO AUTHORIZE STUDIES OF FERC PERMITTEES, PARTICULARLY IN NATIONAL RECREATION AREAS. THIS CONFRONTATION HAS COST GENTRY YEARS OF TIME AND MANY THOUSANDS OF DOLLARS, AND IS A SITUATION REQUIRING THE ATTENTION OF CONGRESS. IT IS SUGGESTED THAT ONE AGENCY BE CLEARLY GRANTED FULL POWERS TO AUTHORIZE SUCH ACTIVITIES, AND WHEREAS FERC HAS A COMPLETE SET OF REGULATIONS ON THE SUBJECT, AND DOI HAS NONE (INSOFAR AS KNOWN TO GENTRY), IT WOULD BE BEST TO STRENGTHEN FERC AUTHORITY IN SUCH REGARD.

4. THE PRINCIPLE OF EQUAL PROTECTION OF THE LAWS IS FURTHER VIOLATED BY THE BOR, STEMMING FROM ITS PROMULGATION OF SPRING CANYON PROJECT ON LAKE MEAD, WHEREAS, THE COLORADO RIVER BASIN PROJECT ACT §605 (43 U.S.C. §1555) DENIES APPLICATION OF THE FEDERAL POWER ACT (AUTHORITY OF FERC) TO THE AREA BETWEEN HOOVER DAM AND GLEN CANYON DAM (PRIMARILY LAKE MEAD), AND DOES NOT GRANT ANY SUCH AUTHORITY TO DOI OR BOR EXCEPT AS MAY BE SEEN IN THE ORIGINAL AUTHORIZATION OF THE HOOVER DAM AND ATTENDANT FACILITIES. THE EXCLUSION OF FERC SHOULD NOT THEREBY GIVE CARTE BLANC AUTHORITY TO THE DOI AND BOR FOR THE SAME GENERAL PURPOSES AND ACTIVITIES, AND GENTRY IS AGGRIEVED BY THE ACTIONS OF BOR AND WAPA IN THIS REGARD. IT IS SUBMITTED THAT WHATEVER THE ORIGINAL PURPOSE OF THIS EXCLUSION OF AUTHORITY, ITS TIME HAS LONG SINCE PASSED.

RESPECTFULLY SUBMITTED,

HAROLD E. PROCTOR
PRESIDENT
GENTRY RESOURCES CORPORATION
11920 E. MAPLE
AURORA, COLORADO 80012

Mr. BEVILL. Is that authorization still in effect?

Mr. BROWN. We did get an authorization for the project in 1944.

Mr. BEVILL. George Washington supported that one.

Mr. BROWN. He did, and I always regret we didn't get Alexander Hamilton on board. After the authorization in 1944, it was reauthorized in 1970, and as you know, it was under construction at one time. Among the other roadblocks that we seem to be overcoming is a study with regard to the wildlife habitat. That has been funded by this committee several times. That study will be finished a few months into the new fiscal year. I hope the committee would think it appropriate to complete that study.

We are asking that the Narrows study be named in the bill. We think that naming of the project is important even though the amount of money is very small, because our friends in the Interior Department will be more inclined to follow up. It would be foolish to come all this way and not finish a study that is critical to the river.

The statement covers a number of other things, except I might add that you and your committee—Mr. Myers and other Members have been good friends over the years and very helpful, I and the folks from Colorado and Nebraska deeply appreciate that. I don't know what your schedule is now, Mr. Chairman, but I know Mr. Treadway wanted to make some remarks.

Mr. BEVILL. All right, could you just summarize for us, Mr. Treadway.

Mr. TREADWAY. Yes, sir. I appreciate the time and Mr. Brown put it very aptly. Mr. Weitzel and I are farmers and cattle feeders and things are a little tough down on the farm but there are some of us who think that it is going to get better. We also believe that maybe the coffers here might be better in time. In the meantime, we do need to keep up our efforts, keep our decree alive in the hopes that shortly we will be in better shape and you will be in better shape and we can complete the dam. That is my own farm viewpoint and I appreciate the time in listening to us.

Mr. BEVILL. I am like you, optimistic about our future. We have had worse problems, you know.

Mr. BROWN. Thank you very much.

Mr. BEVILL. Thank you very much, Hank.

Mr. MYERS. Thanks for coming back.

Mr. BEVILL. Is Mr. Proctor here? Mr. Darold Proctor?

[NO RESPONSE.]

THURSDAY, APRIL 10, 1986.

BUY AMERICAN PROVISION

WITNESS

BERNARD H. FALK, PRESIDENT, NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

Mr. BEVILL. Mr. Falk.

Mr. MYERS. He has been ready all morning.

Mr. BEVILL. Have a seat. Your formal statement will be made part of the record and you may proceed as you wish.

Mr. FALK. Thank you, Mr. Chairman. I am Bernard H. Falk, President of the National Electrical Manufacturers Association (NEMA). I want to thank you for this opportunity to present the concerns of NEMA and its members regarding the challenges and threats to the U.S. electrical power industry from unfair foreign trade practices.

The U.S. electrical power equipment manufacturing industry is the world leader in both technological advances and economic efficiency. Nevertheless, the industry is in a precarious condition. Why? It has suffered, and continues to suffer, from unfair trading practices and unequal competitive access to overseas markets, an uneven playing field.

Foreign manufacturers of heavy electrical equipment have consistently been able to sell their products in the U.S., while their home markets have been effectively closed by their governments to our products. In many cases, this institutionalized protection acts as a subsidy, enabling the foreign companies to undercut U.S. goods in both the American and third country markets. This lack of equivalent competitive opportunities threatens the collapse of the U.S. electrical power equipment industry.

Last year the Congress took an important first step in redressing this inequity by increasing the "Buy American" differential for federal purchases of extra high voltage electric power equipment. Today NEMA urges you to continue this 25 percent differential in the appropriation for fiscal year 1987.

For nearly two decades, NEMA and its member companies have sought reciprocity and equivalent competitive opportunities for electrical power equipment. We have pursued this goal forcefully in every trade negotiation since the early 1960s. Despite these efforts, there is not even token reciprocity from other industrialized nations, regardless of whether or not their electric utilities are government owned. Electrical manufacturing companies in these nations, operating from a base of protected home markets, enjoy a built-in competitive advantage against U.S. companies both here and in third country markets.

Consider for example the outlook for the power transformer segment of the electrical equipment industry. Since the early '70s, the annual physical volume of shipments from U.S. companies is down 72 percent. U.S. employment in that industry dropped from 10,000 jobs in 1971 to 4000 in 1985. This represents a loss of skills and experience that may be irreplaceable.

In contrast, imports of foreign manufactured power transformers have increased rapidly, from 7 percent of the U.S. market in 1970-74, to 10 percent in 1975–79, to nearly 19 percent today.

What is causing this decline in market share for domestic producers? In September 1983, the General Accounting Office (GAO) found that unlike U.S. manufacturers, foreign manufacturers get significant government incentives to export their products and that greatly aids them in their competition in the U.S. and other markets.

In some cases, the GAO reported, foreign manufacturers are selling products both in the U.S. and in third country markets below

their costs in order to maintain jobs and utilize their facilities. This form of dumping is being done at the expense of U.S. skilled workers and the U.S. ability to produce heavy electrical equipment.

The GAO report says that between 1977 and 1981, 51 percent of the purchases of heavy electrical equipment by federal power agencies were from foreign manufacturers. In contrast, an Edison Electric Institute (EEI) survey conducted for the GAO reported that less than 15 percent of the purchases of investor-owned utilities were from foreign manufacturers.

The industry has not been idle in bringing this dilemma to the attention of the government. In 1972, the Office of Emergency Preparedness was informed about the problem in the extra high voltage (EHV) power circuit breaker segment and corrective action was requested. No action was taken, the government arguing that no U.S. manufacturer had dropped out of the business.

Of the four manufacturers developing, designing and producing EHV breakers in the early 1970s, none is in business in 1986. Of the five manufacturers of EHV power transformers in the 1970s, only three remain in business. And of the four manufacturers of shunt reactors in the early 1970s, only one remains in business.

How best to respond is, of course, the question. The congressionally-mandated section 302(d) report of the 1979 Trade Agreement sets forth a series of administration proposals aimed at achieving equity and equivalent competitive access for this product sector. During the negotiations of the Government Procurement Code in the 1979 Tokyo Round, NEMA urged the inclusion of government entities which purchase electrical power equipment. The U.S. negotiators were unsuccessful in obtaining that inclusion because European governments would not agree.

The proposals in the 302 report include expanding the entities covered by the Code through renegotiations and increasing the "Buy American" differential applicable to procurement. Renegotiation of the Code started in earnest in November 1983. As Stated in the 1981 United States Trade Representative's Section 302 report, "If the United States is unable to obtain the agreement of other developed country Code signatories to expand their entity coverage by January 1, 1985, the USTR will recommend to Congress appropriate actions to achieve reciprocity."

NEMA believes the long record of failure to achieve equivalent competitive opportunities and to open the markets of major competitors leaves the United States with only one course of action: to continue to exert pressure and impose progressively stronger countermeasures on such competition until equity and equivalent competitive opportunities are provided.

Based on the action which this subcommittee took last year, the goal of achieving equivalency may be a bit closer. We are encouraged that there has been some movement by the federal utilities to implement the 25 percent differential in fiscal year 1986 procurement. We are also encouraged by recent government discussions to counter unfair and discriminatory procurement practices. Lastly, there has been some strengthening in the renegotiation of the Code to include utilities. The retention of the 25 percent differential is needed to continue the momentum and progress towards achieving equivalency.

Thank you.

[The statement of Mr. Falk follows:]

National Electrical Manufacturers Association

STATEMENT OF

BERNARD H. FALK

PRESIDENT

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION

ON THE

FY1987 ENERGY AND WATER DEVELOPMENT APPROPRIATIONS

BEFORE THE

ENERGY AND WATER DEVELOPMENT SUBCOMMITTEE

HOUSE APPROPRIATIONS COMMITTEE

APRIL 10, 1986

Mr. Chairman and Members of the Subcommittee:

I am Bernard H. Falk, President of the National Electrical Manufacturers Association (NEMA . I want to thank you for this opportunity to present the concerns of NEMA and its members regarding the challenges and threats to the U.S. electrical power industry from unfair foreign trade practices.

The U.S. electrical power equipment manufacturing industry is the world leader in both technological advances and economic efficiency. Nevertheless, the industry is in a precarious condition.' It has suffered, and continues to suffer, from unfair trading practices and unequal competitive access to overseas markets.

Foreign manufacturers of heavy electrical equipment have consistently been able to sell their products in the U.S., while their home markets have been effectively closed by their governments to our products. In many cases, this institutionalized protection acts as a subsidy, enabling the foreign companies to undercut U.S. goods in both the American and third country markets. This lack of equivalent competitive opportunities threatens the collapse of the U.S. electrical power equipment industry.

Last year the Congress took an important first step in redressing this inequity by increasing the "Buy American" differential for federal purchases of extra high voltage electric power equipment. Today, NEMA urges you to continue this 25 percent differential in the appropriation for fiscal year 1987.

As we have said before, NEMA does not come to this conclusion quickly, or without giving considerable thought to its implication. For nearly two decades, NEMA and its member companies have sought reciprocity and equivalent competitive opportunities for electrical power equipment. We have pursued this goal forcefully in every trade negotiation since the early 1960's. Despite these efforts, there is not even token reciprocity from other industrialized nations, regardless of whether or not their electric utilities are government owned. Electrical manufacturing companies in these nations, operating from a base of protected home markets, enjoy a built-in competitive advantage against U.S. companies both here and in third country markets.

Consider for example the outlook for the power transformer segment of the electrical equipment industry. Since the early 70's, the annual physical volume of shipments from U.S. companies is down 72 percent. U.S. employment in that industry dropped from 10,000 jobs in 1971 to 4000 in 1985. This represents a loss of skills and experience that may be irreplaceable.

In contrast, imports of foreign manufactured power transformers have increased rapidly, from 7 percent of the U.S. market in 1970-74, to 10 percent in 1975-79, to nearly 19 percent today.

What is causing this decline in market share for domestic producers? In September 1983, the General Accounting Office (GAO found that unlike U.S. manufacturers, foreign manufacturers get significant government incentives to export their products, and that greatly aids them in their competition in the U.S. and other markets. In some cases, the GAO reported, foreign manufacturers are selling products both in the U.S. and in third country markets below their costs in order to maintain jobs and utilize their facilities. This is being done at the expense of U.S. skilled workers and the U.S. ability to produce heavy electrical equipment.

The GAO report says that between 1977 and 1981, 51 percent of the purchases of heavy electrical equipment by federal power agencies were from foreign manufacturers. In contrast, an Edison Electric Institute (EEI) survey conducted for the GAO reported that less than 15 percent of the purchases of investor-owned utilities were from foreign manufacturers.

The industry has not been idle in bringing this dilemma to the attention of the government. In 1972, the Office of Emergency Preparedness was informed about the problem in the extra high voltage (EHV) power circuit breaker segment and corrective action was requested. No action was taken, the government arguing that no U.S. manufacturer had dropped out of the business. Of the four manufacturers developing, designing and producing EHV breakers in the early 1970's, none is in business in 1986. Of the five manufacturers of EHV power transformers in the 1970's, only three remain in business. And of the four manufacturers of shunt reactors in the early 1970's, only one remains in business.

How best to respond is, of course, the question. The Congressionally-mandated section 302(d) report of the 1979 Trade Agreement sets forth a series of Administration proposals aimed at achieving equity and equivalent competitive access for this product sector. During the negotiations of the Government Procurement Code in the 1979 Tokyo Round, NEMA urged the inclusion of government entities which purchase electrical power equipment. The U.S. negotiators were unsuccessful in obtaining that inclusion because European governments would not agree. The proposals in the 302 report include expanding the entities covered by the Code through renegotiations and increasing the "Buy American" differential applicable to procurement. Renegotiation of the Code started in earnest in November 1983. As stated in the 1981 United States Trade Representative's Section 302 report, "if the United States is unable to obtain the agreement of other developed country Code signatories to expand their entity coverage by January 1, 1985, the USTR will recommend to Congress appropriate actions to achieve reciprocity."

No progress has been made in the heavy electrical product sector and none is expected by most observers. I fully appreciate that renegotiation is multi-faceted and complex and I understand the Administration's position that renegotiation is the preferred approach, however, the renegotiation approach by itself offers no hope in achieving market access and reciprocity.

NEMA believes the long record of failure to achieve equivalent competitive opportunities and to open the markets of major competitors leaves the United States with only one course of action: to continue to exert pressure and impose progressively stronger countermeasures on such competition until equity and equivalent competitive opportunities are provided.

Based on the action which this Subcommittee took last year, the goal of achieving equivalency may be a bit closer. We are encouraged that there has been some movement by the federal utilities to implement the 25% differential in FY-86 procurement. We are also encouraged by recent government discussions to counter unfair and discriminatory procurement practices. Lastly, there has been some strengthening in the renegotiation of the Code to include utilities. The retention of the 25% differential is needed to continue the momentum and progress towards achieving equivalency.

Should the differential not have the desired effect of providing equivalent opportunities for U.S. manufacturers, stronger counter measures will be sought through legislation and through the upcoming new round of trade negotiations. In that regard, NEMA is actively involved in providing negotiation objectives and advice to our trade negotiators.

Therefore, bearing in mind that the objective is to induce foreign governments to truly open up their markets, NEMA urges that similar language be included in the fiscal 1987 legislation.

Thank you.

Mr. BEVILL. Mr. Myers.

Mr. MYERS. Thank you, Mr. Chairman.

Mr. Falk, I apologize for not hearing you this morning, but at the time we thought that Mr. Conte would be able to be here. He did send word that he was tied up this afternoon and would not be able to be here. He understands the problem very well. Firsthand, he is responsible for the section being in our bill, but he did want to apologize for not being here this afternoon.

I have one question. How many companies are in the National Electrical Manufacturers Association?

Mr. FALK. About 575.

Mr. MYERS. Do any of them do business in other countries, or have manufacturing in other countries?

Mr. FALK. Some do.

Mr. MYERS. We had witnesses here yesterday representing firms in Sweden and Switzerland, saying both companies operate in those countries; and those countries did buy from the United States too. Are you aware of any sales by the companies you represent to either Sweden or to Switzerland?

Mr. FALK. I am aware of the fact there have been some sales, but let me characterize the general nature of those sales, the generally high technology leaders, one of a kind, generally of a type of equipment not produced by the home market, and in some instances it is to industrial countries who are not fully under the authority; for example, of the government policy. But I would characterize the sales to electric utilities by U.S. producers in those markets as almost negligible.

Mr. MYERS. I believe the Swiss representative said that Switzerland imported more from the United States than sold to the United States.

Mr. FALK. I think one would have to examine what products are in the mix. We are referring to extra high voltage equipment. I have my doubts about that statement. I think they are importing a lot of electric products such as perhaps consumer goods, some esoteric industrial goods, and that statement was deposited on my desk late yesterday.

I was out of the country until late yesterday, and we have not examined the data. With your indulgence, we would like to examine it and perhaps respond for the record as to an analysis of what that data is.

Mr. MYERS. This record is not going to be open too long.

Mr. FALK. We will get to work on it promptly.

Mr. MYERS. One other question. There are some negotiations—that you referred to I believe in your statement here—underway right now. Do you have any idea how long that will take to come to any conclusion from negotiations with some of these countries?

Mr. FALK. Well, I have been involved in some of those negotiations as an adviser for almost 20 years. I think when the will is there, the negotiations move rather quickly. I think when the European community in particular said we are ready to talk about inclusion of our electrical utilities in a government procurement code, I think you will have an agreement signed before you see the leaves drop this fall—weeks or months.

Mr. MYERS. The European community is a tough competitor and tough negotiator, not only with respect to electrical equipment but all kinds of manufactured products—also agricultural products. I don't think electrical is a minor part of the total trade between the Common Market and United States, is it? You wouldn't have the answer to that.

Mr. FALK. Of course if it is up to us it is a major part.

Mr. MYERS. I am not suggesting it is not a problem, but as far as they are concerned it is a big picture to close their doors to any import from any other country except the Common Market. They would build a fence around the Common Market that is hard to penetrate.

Mr. FALK. You have portrayed it very well, sir.

Mr. MYERS. Thank you very much for your testimony. Again, Mr. Conte was very sorry he couldn't be here this afternoon.

Mr. BEVILL. Mr. Falk, if I understand your testimony now, you are a strong believer in free trade but you also believe in fair trade?

Mr. FALK. That is correct, sir.

Mr. BEVILL. And you feel like this Buy American provision is one way that would help our situation?

Mr. FALK. That is correct.

Mr. BEVILL. You name some 14 companies there, and I think one survived out of 14 in a few years; is that right?

Mr. FALK. None out of five in high voltage switchgear equipment, three out of five in transformers, and I believe one out of four in shunt reactors.

Mr. BEVILL. Okay. So when you get looking at the statistics it's rather shocking, isn't it, as to what is happening in our nation?

Mr. FALK. Yes.

Mr. BEVILL. Now, we have put the Buy American provision in our bill and the House Appropriation Committee as a whole has approved it, and I think the House has approved it several times, haven't they?

Mr. FALK. In the 1986 fiscal year appropriation it was enacted into law.

Mr. BEVILL. Then it was knocked out when it got over to the other house?

Mr. FALK. It reappeared in the markup and the law contains a 25 percent differential.

Mr. BEVILL. You know we have this textile bill that two houses overwhelmingly passed, and the President vetoed it, to try to give the textile industry five years to get back on its feet and eliminate the unfair trade practices. That is schedule for overriding veto on August 6. There are many agreements being entered into by this country with other countries in the month of July.

If they don't do anything except talk like they have done in the past, I think we are going to see the Congress override the President's veto, and that is going to open the door, in my judgment, to some restrictive legislation that is going to eliminate some of these unfair practices in the industry. It is really eliminating the jobs in this country.

So I think if we override the veto, you are going to see steel, your transformers and all other things you have been telling us about

here, I think you are going to see a change in the attitude on unfair trade practices.

Mr. FALK. Yes.

Mr. BEVILL. Thank you very much.

Mr. FALK. Thank you, sir.

[The following was provided for the record:]

National Electrical Manufacturers Association
2101 L Street, N.W. Suite 300
Washington, D.C. 20037 (202) 457-8400
Telex 904077 NEMA WSH

Bernard H. Falk
President

April 15, 1986

The Honorable Tom Bevill
Chairman, Subcommittee on
Energy and Water Development
Appropriations Committee
U.S. House of Representatives
2362 Rayburn House Office Building
Washington, DC 20515

Dear Mr. Chairman:

Testifying April 10 before the Subcommittee, I was asked to supply additional information on the trade in electrical products between the U.S., Sweden, and Switzerland.

The attached analysis is respectfully submitted for the record on the FY1987 Energy and Water Development appropriation.

Sincerely,

Bernard H. Falk

BHF:am

Enclosure

IMPORT/EXPORT DATA FOR "BUY AMERICAN" PROVISIONS

The following information is supplied for the record, as requested, relative to the trade balances between the United States and Sweden and the United States and Switzerland. The data presented covers only the products on the attached listing, which conform generally to the products covered by the FY86 legislation. An explanation is also provided on the attachment as to why the data supplied herein differs so dramatically with the data in written testimony received by the Subcommittee.

TRADE WITH SWEDEN

In Millions of Current Dollars

	1978	1979	1980	1981	1982	1983	1984	1985
U.S. exports	5.0	6.9	5.8	8.3	7.6	17.6	10.8	11.3
U.S. imports	10.0	8.3	19.1	20.5	7.4	24.4	25.1	91.9
Balance(X-M)	-5.0	-1.4	-13.3	-12.2	0.2	-6.8	-14.3	-80.6

TRADE WITH SWITZERLAND

In Millions of Current Dollars

	1978	1979	1980	1981	1982	1983	1984	1985
U.S. exports	9.6	10.4	14.6	12.9	12.9	10.3	11.8	14.8
U.S. imports	37.4	130.4	110.9	90.4	20.9	18.8	32.6	72.4
Balance(X-M)	-27.8	-120.0	-96.3	-77.5	-8.9	-8.5	-20.8	-57.6

Source: U.S. Bureau of the Census FT 410 reports for exports; FT 135 reports for imports. Various years as noted. Import data is cif; export fob.

EXPLANATION OF DATA USED AND PRODUCTS COVERED

Data supplied in the testimony from ASEA identified the categories included to be from the U.S. Commerce Department's annual export/import statistics for SITC code 71 and 77 for each of the years. Data supplied in the testimony from Brown-Boveri did not identify the source or coverage of products included aside from the generic "electrical equipment."

1. SITC code 71 encompasses "power generating machinery and equipment" which specifically includes: steam boilers, steam engines, steam turbines, aircraft engines, outboard motors, diesel engines piston-type engines, aircraft and jet turbines, internal combustion engines, water wheels, motors, generators, and parts for the foregoing. The scope of products cover a vast number of articles which are not germane to the procurement by utilities under discussion.

The NEMA supplied data covers only data for steam turbines and parts thereof (Schedule E 712.0020-0050; SITC 71200). These data are representative of the type of products covered by the legislation.

2. SITC code 77 encompasses a vast number of electrical equipment such as: transformers, ballasts, circuit breakers, switches, relays, fuses, connectors, lampholders, switchgear and assemblies, motor starters, terminals, conduit, christmas tree lights, X-ray and other medical equipment, washing machines, dryers, electric shavers, blenders, food processors, and an assortment of home appliances, electronic tubes, diodes, and devices, spark plugs, lamps, batteries, smoke detectors, and hand tools. Again, the product coverage is much too broad when considering that the legislation pertains to electrical products procured by utilities.

The NEMA supplied data covers only data for power transformers, circuit breakers, electric rectifiers, fuses, switchgear assemblies, terminals, arresters, and parts thereof, nspf (Schedule A 771.1030-1080, 771.2020. 771.2050, 771.2060, 772.1004-1008, 772.1034, 772.1056-1060, 772.1072-1078).

Consequently, while the general trade with Sweden and Switzerland in electrical equipment has been marked with positive U.S. trade balances (until 1985), trade in the electrical products which could be subject to the legislation is dramatically unbalanced and shows a markedly negative trade balance.

THURSDAY, APRIL 10, 1986.

FLORIDA PROJECTS

WITNESSES

HON. CHARLES E. BENNETT, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF FLORIDA

HON. EARL HUTTO, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF FLORIDA

HON. DON FUQUA, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF FLORIDA

VICTORIA J. TSCHINKEL, SECRETARY, FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION

Mr. BEVILL. We are waiting on the Florida delegation. The chair recognizes our good friend and colleague, Congressman Charlie Bennett from Florida, dean of the delegation, and a man who always does a good job of presenting his testimony.

Mr. BENNETT. Great to be with you.

Mr. BEVILL. You may proceed as you wish.

Mr. BENNETT. I strongly urge the inclusion of $7.0 million to restore the Mill/Cove waterway in Jacksonville. This formerly important waterway was very detrimentally affected by the harbor improvements made by the Corps to deepen Jacksonville harbor. The detrimental result has been the virtual closing of the Mill/Cove waterway, with depreciation of property values and destruction of recreational values.

In all justice, this damage done by the harbor development must be rectified. This project has been approved by the Corps as part of the harbor development project, and I urge its immediate funding. The State requests $2 million for the first stage in construction of the project.

The State has requested $375,000 for an ongoing study to provide information for proper floodplain management in the area of the St. Marys River floodplain. The St. Marys River forms the border between the northeastern portion of Florida and the southeastern portion of Georgia. The floodplain drains approximately 1,500 square miles. Recently, the Kings Bay Naval Submarine Base has been established in the area—the East Coast Trident Submarine Base.

This study is the first of its kind for the area and is greatly needed if the environmental impact of future growth in the area, naval and otherwise, is going to be adequately understood. The study will result in a hydrologic model of the St. Marys River Basin and will be essential for future water resource management.

I strongly recommend continued funding for this project, as I believe it will be one of the most important projects this committee will assess.

The President's budget requests $3.2 million to renourish the Duval County beaches to prevent further beach erosion. This is necessary because several strong northeasterns in recent years washed away much of the renourishment accomplished in the previous four years. I fully support this appropriation as greatly needed.

The President's budget also requests $3.772 million for maintenance dredging of Jacksonville harbor, as well as $2.125 million for Fernandina Beach harbor. I fully support these requests as the ongoing operation and maintenance of these important harbors is essential for the navigational values of these harbors.

The State and the City of Jacksonville have also requested $200,000 for a study to assess the Jacksonville Harbor Channel in the St. Johns River for possible improvements to navigation, erosion problems, and recreation. Historically, the St. Johns River has had a number of problems. These include erosion of the shoreline due to shipping and boating activities in the main channel, navigational deficiencies and derelict vessels which impede navigation, inadequate flood protection, environmental degradation, and a lack of recreational facilities to serve fishermen, picnickers, and tourists.

The study would identify problems caused by years of neglect and determine methods to restore and enhance the shoreline and environment in general. Fiscal year 1987 funding would be used to begin the study.

The State and the City of Jacksonville have also requested $100,000 for funding a feasibility study under the Corps 710 Recreational Development Program for an urban park located on the St. John's River approximately two miles from downtown Jacksonville. There is a high demand for outdoor recreational facilities in this area, and existing facilities do not meet current needs. The metropolitan park is centrally located, has easy access to the river and is an ideal location for a marina and boat ramps. The fiscal year 1987 funding would initiate the study.

On behalf of Congressman Fascell, who wanted to be here, I offer his Statement for the record. He had to go to the White House with regard to the situation in Nicaragua and also in Libya.

Mr. BEVILL. Without objection, it will be made a part of the record.

[The statement of Mr. Fascell follows:]

STATEMENT OF CONGRESSMAN DANTE B. FASCELL BEFORE THE ENERGY AND WATER DEVELOPMENT APPROPRIATIONS SUBCOMMITTEE

April 10, 1986

Mr. Chairman and members of the subcommittee, I appreciate your giving us the time, once again, to present to you our water project needs for Fiscal Year 1987. At this time of drastic budget cuts, we all have a very difficult job to do and yours is perhaps one of the most painful since it means making some very hard choices between many worthy projects. The projects I am supporting today, in the 19th Congressional District, are those that I believe are the most important and most necessary and I urge your favorable consideration. They are as follows:

MONROE COUNTY BEACH EROSION

This project would provide improvements to Smathers Beach in Key West--the only public beach in a city almost entirely dependent on tourism for its economic sustenance. It is a relatively small project compared to most of the others being requested. Total construction cost is estimated at $3 million. Over the last three years we have appropriated sufficient funds to complete pre-construction engineering and planning. However, of this amount, the administration has placed a "hold" on the last increment, which was appropriated last year. The reason for this action is apparently because the administration believes that local authorities should play more of a role in recreaton projects, despite the fact that a) the project is already on a 50%-50% cost sharing basis; b) no request for a change in the cost-sharing

formula was made in the Omnibus Water Resources Act for this type of project; c) the Congress has indicated its support for the project by appropriating the money; and d) while the project may be for recreation purposes, it is in a community whose economy depends on recreational facilities. Thus, this small but important project has been stretched out so that it is taking far longer than it should to complete and, in fact, may never be completed if the administration continues to arbitrarily flout the will of Congress.

$93,000 is required to complete the planning and engineering phase. I urge you to again provide these funds, not only because this project is badly needed in Key West, but to restate the Congressional intent that it move forward. This community has already been waiting years to see some improvement on this beach. Let's not stretch it out any longer.

MIAMI HARBOR CHANNEL

A three-year study to straighten the channel and widen the turning basin at Miami Harbor has been completed and $250,000 is requested to begin initial construction.

The channel leading out of the harbor has a 60 degree "dogleg" which makes navigation hazardous for the larger vessels which now utilize the facility. A similar danger exists in the turning basin, which is extremely difficult for the large cruise ships to negotiate. The cruise business is a major element of the tourist economy in South Florida. The potential for running aground as a result of the bend in the channel or the effort to turn in the small basin poses not only safety problems for those aboard, but a possibility of serious financial loss to the ships' owners. This project is vital and should be funded.

CENTRAL AND SOUTHERN FLORIDA FLOOD CONTROL PROJECT

The President's budget requests $15 million for continued work on the Central and Southern Florida Flood Control Project. One of the key elements of the planning for FY 87 includes a modification of an existing canal to restore natural water flow to Everglades National Park without reducing existing levels of flood protection for other areas. This modification is a result of an on-going study authorized three years ago to provide a more natural water flow balance to the Park, which is necessary for its ecological survival. I fully support this project.

Mr. Chairman, as I indicated earlier, these are difficult times. While we must take drastic measures to reduce the largest deficit in our nation's history, we cannot stop all government activities. There are some projects which are important to our communities, and in which they share the cost, in which the federal government has an important role to play. I have indicated those which I believe deserve priority. The hard choice is now yours and I know you will act prudently and wisely.

Mr. BENNETT. Congressman Don Fuqua I believe is here. Don, you are the next one. Earl Hutto.

Mr. BEVILL. We are always glad to hear from you.

Mr. HUTTO. Thank you very much, and it is always a pleasure to have an opportunity to appear before your subcommittee regarding the Florida delegation's energy and water development appropriations request. I support the State's request and hope that your subcommittee will approve our full program.

In addition, I would like to express my special support for a couple of projects and they are as follows:

The Northwest Florida Water Management District is requesting $1 million to study groundwater quality and availability for public supply throughout the Northwest Florida coastal area. This project would include the construction of test monitoring wells along the coast. These wells will help provide information on fresh and salt water in the Florida aquifer, determine the availability of public supply, and assist in refining existing groundwater management plans.

The population along the coast of Northwest Florida has grown dramatically in recent years, as has the number of tourists. Consequently, during the summer months, most public water supply systems in the area operate at capacity levels. There is an acute need for a study to provide water managers with alternatives to meet these increasing water supply demands. I fully support the funding of this project.

The State and the City of Mexico Beach are requesting funds to continue planning and engineering to modify the entrance channel to Mexico Beach Inlet. These modifications would enhance navigation in the channel, which is used by over 10,000 boaters annually. The Corps of Engineers has studied this project and has concluded that it is necessary, of Federal interest and that it would provide substantial economic benefits.

Mexico Beach is located southeast of Panama City in Northwest Florida. The area is dependent on tourism for its livelihood, but the uncertainty of navigation in the channel discourages some people from visiting. Improvements to the channel will benefit Mexico Beach's economy, contribute to reduced erosion at the mouth of the passage, and provide safer refuge for boaters during storms. Currently, no safe harbor exists between Panama City and Port St. Joe, a distance of some 30 miles. I strongly encourage the subcommittee to fund this project.

It is a pleasure to be here with Secretary Tschinkel to support our State projects and also I would say that I appreciate your support for the Corps of Engineers maintenance dredging projects in northwest Florida and throughout the State. Thank you, Mr. Chairman.

Mr. WATKINS [presiding]. Thank you.

Mr. BENNETT. Don Fuqua wanted to be at the very end because he wants to combine some other information. He would normally be at this point. Claude Pepper's Statement is here, Bill Nelson and Lewis, are they here? They will submit Statements for the record as well as Andy Ireland, Mike Bilirakis and Larry Smith.

[The statements of Messrs. Pepper, Ireland, Bilirakis, Young, Lewis, and Smith follow:]

STATEMENT OF THE HON. CLAUDE PEPPER BEFORE THE HOUSE APPROPRIATIONS SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT
APRIL 10, 1986

MR. CHAIRMAN, I want to commend and thank you and the members of this Committee for the fine job you have done for our nation - making it possible for growth to take place and jobs to be created in almost every corner of this great and beautiful country.

First off, I'd like to thank you also for the Key Biscayne Beach Restoration project for which money was set aside and which, I understand, the Corps of Engineers of the Army will undertake this year, following initial preparations. The people of Miami and Key Biscayne are very appreciative of the fact that they will soon have back the expanse of clean, attractive beaches that delight visitors and vacationers and accommodate many of our local people in their wonderful, warm locale.

Secondly, as you know, Congress has consecutively funded for five years a study by the Corps into the navigation problems associated with the current configuration of the Miami Harbor ship channel. Thank you for your consistent support of this very important matter for the 18th District of Florida and for the Port of Miami. This investigation will conclude this year.

We need $250,000 to be appropriated for FY 87 in order to proceed with the preliminary engineering aspects of the final design for the deeper channel, which will be the amount, I hope, that the State of Florida may request and the Corps will be able to carry out.

(contd.)

Miami Port officials and the Biscayne Bay Pilots are extremely concerned with the navigation hazards associated with the current configuration of the ship channel. The bend in the access channel has actually caused several groundings of large vessels in recent years. Additionally, the constriction of the ship channel inside Government Cut causes a navigation hazard compounded by strong tides and winds. The main turning basin presents problems to ships over 1,000 feet long in positioning and dealing with tides, currents and winds.

Mr. Chairman, I am concerned that this important project move forward without delay. I support and join the State of Florida in requesting that the subcommittee provide funding for the engineering work in the FY '87 energy and water appropriations measure.

Third, I am very concerned over the deplorable state of the Miami River in my District, which cuts right through the very heart of Miami, from the Airport to Biscayne Bay. Pursuant to a study, which is substantially physically complete now, it was found that years of pollution have resulted in silt and sludge accumulation of hazardous toxicity to the people living in Miami which prevents the River from being cleaned up and used partially for recreational purposes. There is a dire need for such a clean-up and an effort to plan, at the same time, how future runoff can be controlled and the River integrated in a useful way into the

future urban landscape of Miami. Since this effort has for many years been stymied by the multiplicity of adjacent use patterns, as well as political jurisdictions, the Governor of Florida, Hon. Bob Graham, appointed a Miami River Management Commission which has tried to draw up suggestions for action and focus attention on the problems of the River. A Federal commitment is now urgently needed, to stimulate further local progress.

H.R. 6 which passed in the House on November 13 of last year, contains a provision authorizing the Federal commitment for cleanup of the River and providing an incentive for comprehensive cooperation among the local governments, with the help of the expertise of a clearly defined Commission to consist of seven members appointed by the Governor. The language clearly specifies that conditions necessary for initial dredging must be met to mutual satisfaction and that subsequent maintenance must be taken into account before dredging and waste removal may proceed. The Corps has contended at some time in the past that the hazardous sediments are not being disturbed and do not need to be removed. However, we know that present depth of the center of the channel is only being maintained by the action of ship bottoms scraping the sludge from the center toward the sides and screw propellers used by these ships in fact move a significant amount of these contaminated sludges into our beautiful Biscayne Bay. Therefore, I would urge your appropriating $50,000 to be granted to the Governor of Florida through the Secretary of the Army as an aid to the Commission in planning and coordinating the countywide impact of this project.

Since H.R. 6 has already passed in the House and the Senate has passed its own version of the bill, we anticipate that the Conference may adopt this provision when it meets fairly soon and for that purpose would appreciate an appropriation. To allow the Corps to begin initial engineering design and liaison functions with the local Commission and other involved authorities, it would also be desirable to appropriate $150,000 to carry out the provisions of Section 1199I., and Section 1199S. of H.R. 6 (see attached).

Thus the total for the overall package in FY 87 would amount to $200,000 for the Miami River Management Commission (unsalaried) and the clean-up of the River.

Finally, I would like to refer to an ongoing authority which became law some years ago in which the Corps would conduct a study to determine the comprehensive impact of various uses upon the fragile environment of Biscayne Bay, which is one of the most beautiful semi-sheltered lagoon habitats in the United States, while also being situated right in the middle between Miami and Miami Beach in Dade County. The impact from various uses and developments on and near the Bay represent a serious danger to the County unless the quantities of change and the dynamics of chemical contamination are known in order to preserve this vital Bay.

The Corps, since spending $75,000 for this purpose in FY 85, has not spent any further appropriated amounts and should be directed to do so. The remaining amount needed to be appropriated is $675,000 of which at least a significant portion should be spent immediately to move on with this study of Biscayne Bay. Thank you.

II

Calendar No. 425

99TH CONGRESS
1ST SESSION

H. R. 6

IN THE SENATE OF THE UNITED STATES

NOVEMBER 21 (legislative day, NOVEMBER 18), 1985
Received; read twice and placed on the calendar

AN ACT

To provide for the conservation and development of water and related resources and the improvement and rehabilitation of the Nation's water resources infrastructure.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Water Resources Conservation, Development, and Infrastructure Improvement and Rehabilitation Act of 1985".

SEC. 2. In order to insure against cost overruns, each estimated cost set forth in this Act for a project shall be the maximum amount authorized to pay for the Federal share of the cost of that project, except that such maximum amount shall be automatically increased for—

significant to the economic and social development of the insular area concerned.

SEC. 1199H. (a) The Secretary shall make a grant of $50,000, subject to an appropriation for that purpose, to the Governor of the State of Florida for the establishment of a Miami River Management Commission to develop a comprehensive plan for improving the water quality of the Miami River, Florida, and its tributaries and managing all activities which affect the water quality and use of such river and tributaries. The commission shall be composed of seven members appointed by the Governor.

(b) There is authorized to be appropriated to carry out this section $50,000 for fiscal years beginning after September 30, 1985.

SEC. 1199I. The Secretary shall remove from the Miami River and Seybold Canal in Miami, Florida, between the mouth of the Miami River and the salinity control structure of 36th Street, any abandoned vessels and any vessels under the control of the United States by reason of their seizure or forfeiture. The Secretary shall enter into an interagency agreement to facilitate the removal of any vessel under the control of the United States with the head of any Federal department, agency, or instrumentality which has control of such vessel.

for, or the actual construction of, such project if such acquisition and actual construction have not been approved by resolution adopted by each such committee. Agreements for local financial participation shall include the repayment agreements set forth in subsection (a) so as to meet up front costs contributions as required by Federal law together with full amortization of the remaining Federal investment including costs of project feasibility studies.

SEC. 1199S. The Secretary is authorized and directed to remove polluted bottom sediments, at full Federal expense, from the Miami River and Seybold Canal in Miami, Florida, between the mouth of the Miami River and the salinity control structure at 36th Street. Local interest shall furnish all lands, easements, rights-of-way, relocations, and alterations necessary for initial dredging and subsequent maintenance before the Secretary removes any such sediments.

SEC. 1199T. The Secretary is authorized to rehabilitate the Eisenhower and Snell Locks, Saint Lawrence River, Massena, New York, in accordance with the Reconnaissance Report prepared for the Saint Lawrence Seaway Development Corporation by the district engineer for the Buffalo District, dated November 1984 and revised February 1985, at full Federal expense.

SEC. 1199U. The Secretary shall allow a State or its political subdivisions or nonprofit entity to withdraw water

TESTIMONY OF THE HONORABLE ANDY IRELAND

BEFORE THE

HOUSE SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

April 10, 1986

MR. CHAIRMAN, I appreciate this opportunity to express my support for federal assumption of the maintenance of Port Manatee, Florida.

The Army Corps of Engineers, through the Assistant Secretary of the Army for Public Works, last year transmitted its report on the Port Manatee project to Congress. The Corps recommends federal assumption of the project anticipating that this plan would have a favorable economic impact on the area. It would create a more favorable business industrial climate, broaden the tax base, and in turn, lead to increased employment.

Much of the land surrounding Port Manatee, as well as other parts of Manatee County is engaged in agriculture, primarily citrus and other fruit and vegetable production. As the Members of this Committee may be aware, the State of Florida has in recent years, due to weather and disease related disasters, suffered serious setbacks in its mainstay agricultural producer, citrus. I believe it extremely important for the economic health of these areas to diversify their economies. The maintenance of Port Manatee is crucial to this area's efforts to provide a varied economic base.

Port Manatee is located near the entrance to Tampa Bay on its southern shoreline. Petroleum has been the principal commodity moved through the port since its initial construction by local Manatee interests in 1970. Total petroleum tonnages increased over 70% from 1972 to 1977. The tonnages of bulk and general cargo moving through the harbor are also steadily increasing. The counties served by the port, include Sarasota, Highlands, Hardee, Polk, and DeSoto as well as Manatee.

Shipping through facilities located at Port Manatee is being restricted by inadequate channel depths due to sedimentation. Aside from the other commodities passing through the area, the Port is an important link for the continuous flow of petroleum supplied to electrical generating plants and industrial and other users in the area. To support the increasing population and industrial growth and prosperity, it is anticipated that large amounts of energy resources will be needed. Periodic maintenance of the channel is necessary in order to avoid additional transportation costs.

Mr. Chairman, I know we are all concerned about the federal government taking on additional projects in a time of burgeoning deficits. However, I do not believe we should close our eyes to projects which will in the long run give back more than they take. In addition, this year's water

projects bill implements a landmark cost-sharing program which requires 25% state participation, reducing project cost to the federal government. I believe the plan the Corps is proposing is a reasonable one.

I respectfully submit that this is a most worthwhile project and request this Committee to approve it.

Statement of the Honorable Michael Bilirakis
April 10, 1986
Subcommittee on Energy and Water Development
Committee on Appropriations

Mr. Chairman, I appreciate this opportunity to express my support for the Florida Department of Environmental Regulation's FY 1987 request for funding to support the State's public works program.

As usual, Secretary Tschinkel and her staff, in conjunction with the US Army Corps of Engineers, have done a fine job in developing a solid program for preserving and enhancing the State's water resources and for protecting Florida's citizens from the threat of flooding. I fully support the State's request for appropriations to support the federal government's share of costs for these projects and I urge the Subcommittee to act favorably on this request.

One project that is of special concern to the citizens of Clearwater, Florida, whom I am privileged to represent, is the Clearwater spoil disposal study. The population in the Clearwater area continues to grow at a rapid pace. As a result, commercial and recreational boating activities are also expanding, which in turn increases the need for maintenance dredging.

Presently, however, little is known about the physical and chemical characteristics of the sediments to be dredged. Such knowledge is essential to identifying appropriate disposal sites for the spoil. The Clearwater spoil disposal study will accomplish both of these goals by providing hard data on the quality of the dredged material and outlining the suitable options for its disposal.

In FY 1985, $60,000 was appropriated to conduct the initial reconnaissance study for this project and a draft report has been prepared. Last year, an additional $100,000 was made available as part of the federal share of costs to carry out the full study.

DER's request for FY 1987 is $177,000. However, I would note that this amount includes new appropriations of only $77,000. The remaining $100,000 represents last year's appropriation which has not yet been released pending a final determination of the cost-sharing formula. I am pleased to report that city officials in Clearwater have assured me that the community is willing to participate in the necessary cost-sharing agreement and awaits a final decision on this matter. Therefore, I hope the subcommittee will provide the necessary funds to assure that this project moves forward.

I would also like to update the subcommittee on the status of another project in my District for which no funds are being requested. Last year, I came before you to request funding for an economic restudy of an authorized project to dredge Hudson Channel in Pasco County. Seventy-five thousand dollars was appropriated.

The preliminary reconnaissance study is nearing completion and a solid, cooperative effort has developed between the Corps of Engineers, the Department of Environmental Regulation, the Department of Natural Resources and the local community. The County Government has joined with the private sector in the community to provide the $50,000 required from the project sponsor under the cost-sharing agreement, and the restudy is proceeding on track. I just wanted to take this opportunity to thank the members of the subcommittee for their support of this project.

Again, Mr. Chairman, thank you very much for allowing me to express my support for the State of Florida's FY 1987 public works request.

TESTIMONY OF U.S. REP. C. W. BILL YOUNG

BEFORE THE HOUSE APPROPRIATIONS

SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

April 10, 1986

Mr. Chairman, I want to thank you and the members of the Committee for inviting our delegation and state officials to present Florida's fiscal year 1987 public works appropriations requests. We are most appreciative of your work last year, as in previous years, to provide for our state's varied needs.

Last year was a particularly difficult year for Florida because our residents endured an inordinate number of hurricanes and tropical storms. The high winds and heavy rains of three hurricanes pounded Pinellas County, which I represent. Work to rebuild and cleanup our county continues to this day, as it does throughout our state. Damage to public and private property in Pinellas County well exceeded $100 million.

Private homes and businesses are being repaired and rebuilt with flood insurance funds. Federal, state, and local emergency cleanup programs are helping our counties, cities, and towns repair damage to roads, schools, and other public facilities.

Among the most serious damage that was not covered by insurance or other emergency programs was the destruction of Pinellas County's beaches. Because of the support of your committee, some communities which have participated in federal beach nourishment and erosion control projects in the past are eligible for federal assistance to repair storm damage. Other communities, which were scheduled to participate in the project in future years or which had previously elected not to participate but have now agreed to become a part of the program, were not eligible for federal emergency assistance.

The State's preliminary public works program for fiscal year 1987, which was developed and submitted to the Office of Management and Budget prior to the receipt of storm damage estimates last year, requested $2.6 million for continuing work on the Pinellas County beach nourishment and erosion control project. In particular, the State's preliminary request was for the placement of 521,000 cubic yards of sand on 2.1 miles of shoreline along Redington Beach, North Redington Beach, Redington Shores, and Indian Shores. The request also included funds for the construction of a breakwater along Indian Rocks Beach and the nourishment of 3,000 feet of beachfront there.

In response to my request to the Office of Management and Budget to favorably consider the state's request, the President's 1987 budget included $1.6 million for Pinellas County beach projects.

The state has since released its final public works appropriations request, and as you will note from the documents before you, its request for federal assistance to Pinellas County has been increased to $12.2 million. This large increase reflects the state and county's revised assessment of need based on damage from the three storms, which damaged and destroyed much of Pinellas County's beaches. The state, county, and municipalities are prepared to match the federal government's share of this project, which would place more than 1.5 million cubic yards of sand along 10 miles of shoreline in Redington Beach, North Redington Shores, Indian Shores, and Indian Rocks Beach. The project would also include construction of an offshore breakwater, as mentioned previously, along Indian Rocks Beach -- the beach area most severely affected by last year's storms.

The state's request for this project is of a greater magnitude than ever submitted before, but the three consecutive storms that lashed Pinellas County's shoreline have left the beaches more severely damaged and vulnerable than ever before. These storms left no time for the beaches to recover naturally or renourish themselves. As a result, public and private property along the county's entire shoreline is highly susceptible to damage in the upcoming hurricane and tropical storm season.

The beaches are one of Florida and Pinellas County's greatest natural resources and are the primary attraction for the more than three million tourists who visit our county each year. Projects funded by your committee have helped to preserve the natural beauty of our beaches so that they can be enjoyed by residents and tourists alike. I hope that we can work together to meet the needs of the state's special request so that we can restore and preserve the beauty of our beaches.

Before closing, Mr. Chairman, I would like to highlight the state's other requests for Pinellas County. The first is for $207,000 to complete the Tampa Bay Region Hurricane Refuge Alternative. This program would study ways to shorten the evacuation time for the Tampa Bay area.

If you recall last September, state and county officials evacuated more than 300,000 Pinellas County residents as Hurricane Elena made its way for our shoreline. This was the largest single evacuation in our nation's history, and was responsible for preventing catastrophic loss of life and personal injuries during the storm.

Our experience last year demonstrated the serious need to provide for alternative evacuation plans. Pinellas County residents spent as many as three days in emergency shelters while waiting out the storm which skirted our coastline. The prospect for an even larger evacuation for a longer period of time looms with Pinellas County's growing population.

The Committee previously has provided for $75,000 to initiate this study, and I hope the committee will appropriate the remaining funds to complete the task. The events of last year dramatically show the need to expedite this work to provide needed contingency plans for the safety of Tampa Bay area residents.

The state also requests $177,000 to complete the Clearwater Spoil Disposal Study. Increased commercial and recreational interest in the use of the waterways around Clearwater Bay has created a need for future dredging of this area. In addition, the Coast Guard recently opened a new station along Sand Key and depends upon these waterways for quick access, through Clearwater Bay, to the Gulf of Mexico. In anticipation of the need for maintenance of these waterways, the Army Corps of Engineers is preparing a study to evaluate spoil disposal alternatives.

The committee provided $60,000 in past years to initiate the study and I hope we can appropriate the remaining funds so that we can complete this project.

Finally, I would like to call the Committee's attention to the state's final request for Pinellas County. The state asks for $75,000 to complete an economic restudy of the Port of St. Petersburg. Mr. Chairman, I want to thank the committee for fully funding this study last year. The Army Corps of Engineers is now beginning work on the study and has informed me that no new appropriations will be necessary this year to complete the project.

As always, Mr. Chairman, it is a pleasure to work with your committee to provide for the needs of our state, whether those needs be anticipated or of an emergency nature. The events of last year have resulted in special requests of the Committee this year, and I want to thank you in advance for considering these special circumstances. You and the members of your committee are to be commended for your diligent work in reviewing these requests and I look forward to working with you to provide any additional information that might be needed.

Thank you.

TESTIMONY OF

THE HONORABLE TOM LEWIS

ENERGY AND WATER DEVELOPMENT SUBCOMMITTEE

HOUSE COMMITTEE ON APPROPRIATIONS

APRIL 10, 1986

Mr. Chairman, thank you for the opportunity to present testimony before the Subcommittee in support of the State of Florida's requests for energy and water development project funding for fiscal year 1987.

Let the record show that I support all requests made today by the Florida Department of Environmental Regulation to the Subcommittee. However, I should like to direct the Subcommittee's attention to several projects which are of particular interest to me and to the people of Florida's Twelfth Congressional District.

The City of Fort Pierce is located in St. Lucie County on the central Atlantic Florida coast. The Fort Pierce Harbor, 3.5 miles in length and 25 feet deep, provides much needed access to the city for the shipment of fresh citrus products, citrus pellets and aragonite - commodities which are vital to the economic welfare of Fort Pierce.

In late August, 1985, the Army Corps of Engineers recommended deepening the Fort Pierce Harbor access channel and harbor area. This recommendation is substantially smaller than that originally proposed by the Corps. It is believed that by providing greater access to

deeper draft ships carrying citrus and aragonite, transporation savings will not only benefit the shippers but also the consumers and users of these commodities. This aspect is magnified by the fact that the Florida citrus belt continues to move southward into the Fort Pierce area. No doubt, this increased productivity will increase the need to provide greater access to deeper commercial draft ships.

In addition, environmental and recreational benefits could result from this project as increased tidal flushing may improve the overall water quality and the conversion of some of the deep water to shallow water.

At this time, it is necessary to complete and refine the recommendations made by the Corps in order to better understand the implications of this project. I therefore support the State's request for $90,000 to be used for the completion of the preconstruction planning.

The State of Florida has also requested $100,000 for a navigation study of the Jupiter Inlet in northern Palm Beach County. This inlet is a natural waterway, but is not currently being maintained as a navigation inlet. Therefore, its use is limited only to those boaters who are familiar with local conditions. Commercial fishermen and recreational boaters have used the inlet in the past, but passage is treacherous, if not impossible, during periods of low tides or high

seas or swells since the depths across the ocean bar at its entrance are inadequate to assure navigational safety. Over the past twenty years, approximately ten people have been killed in boating accidents at the inlet.

Mr. Chairman, for reasons of public safety, I would urge the Subcommittee's approval of the necessary funding for a navigation study of the Jupiter inlet.

And finally, Mr. Chairman, I request that the Subcommittee provide the necessary funds, as requested by the State, for the Fort Pierce beach renourishment project.

Over the past years, the beach south of the Fort Pierce inlet has receded at an incredibly rapid pace. This recision has threatened both private and public uses of this property, in particular, the South Shore Park and the Surfside Park.

By providing the necessary monies and therefore restoring the beach, we can preserve the existing recreational resource and protect capital investments.

Again, Mr. Chairman, I appreciate your kindness in allowing me to provide testimony on behalf of Florida's requests.

LAWRENCE J. SMITH
16TH DISTRICT, FLORIDA

COMMITTEE ON FOREIGN AFFAIRS
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INTERNATIONAL OPERATIONS
CHAIRMAN, TASK FORCE ON INTERNATIONAL NARCOTICS CONTROL
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Congress of the United States
House of Representatives
Washington, DC 20515

April 16, 1986

Hon. Tom Bevill
Chairman, Energy & Water
Development Subcommittee
2362 Rayburn H.O.B.
Washington, DC 20515

Dear Mr. Chairman:

I am enclosing a statement to be inserted into the Subcommittee's record of April 10, 1986, for the Energy and Water Development Hearings on the FY 87 Budget.

I appreciate your attention to this matter.

With best wishes, I am

Very truly yours,

LAWRENCE J. SMITH
Member of Congress

LJS:ejl
Enclosure

STATEMENT OF REPRESENTATIVE LAWRENCE J. SMITH (D-FL)
COMMITTEE OF APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT
APRIL 10, 1986

ENERGY AND WATER DEVELOPMENT HEARINGS ON FY 87 BUDGET

Mr. Chairman, Port Everglaies is the deepest harbor south of Norfolk and has the second largest petroleum holding area in the United States. It is the fourth busiest passenger terminal in the entire world. Port Everglades is an integral part of Florida's economy. In 1984, Port Everglades handled 437 ships, many of which carried containerized cargo, plus 713 petroleum tankers or barges, and an additional 190 naval vessels also visited the port. And in 1985 an estimated 20 cruise ships carried 330,000 passengers in and out of Port Everglades.

Florida is one of the fastest growing states in the nation. As such, the state must build an infrastructute to accomodate its growing population. The ability to expand Port Everglades is an essential part of South Florida's transportation plan to meet the economic needs of the area.

Located on the southeast coast of Florida, Port Everglades is ideally connected to inland road and rail systems that provide the transportation hub to service this growing population. The inherent delay in accomplishing needed dredging is inhibiting the necessary growth of the Port.

I understand that the budget requests $50,000 in FY 87 for a feasibility study on expansion of Port Everglades. I strongly support the Port Everglades FY 87 budget request. Clearly, the Port needs Federal support to maintain and upgrade its facilities to deliver its services. The Port and the local community have demonstrated a willingness to share in the financial burden of development.

In addition, the Army Corps of Engineers has requested: $4 million for beach erosion, Broward County, Florida; $2 million for Beach erosion and flood control, Dade County, Florida, for construction to add sand to the beach; $6 million for North of Haulover Beach Park, Dade County, Florida for flood control; and $3,778,000 for maintainence operations of the Intercoastal Waterway from Jacksonville to Miami, Florida.

These budget requests have a direct economic impact on my constituents. I hope that you will recognize the importance of these projects to South Flordia and that the Subcommittee will give these requests your highest consideration.

Mr. WATKINS. Mr. Nelson has been here.

Mr. BENNETT. Those we will submit for the record and at this point I will introduce to you Victoria Tschinkel, who is Secretary of the Department of Environmental Regulation of the State of Florida. I am sure no State has a more beautiful secretary.

Ms. TSCHINKEL. Thank you, Mr. Bennett.

Mr. WATKINS. Your entire testimony will be made a part of the record.

Ms. TSCHINKEL. I am going to summarize. You probably know, I have had the pleasure of testifying before your committee.

Mr. WATKINS. Last year.

Ms. TSCHINKEL. That is right, and about four years previous, so that the State of Florida presents a consolidated public works testimony, which our congressmen have been referring to, and the Governor of the State of Florida is responsible for that under law and strongly supports the funding for approximately 45 projects which are included in our request for a total of $84 million.

The booklet contains descriptions of all the projects and our views on all those projects, so I don't need to go into them in great detail. I did want to summarize a couple aspects of my remarks because I think to some degree it is time for us to begin a reexamination of the role of the Corps of Engineers with respect to the States.

The Federal Government has played a major role in water resources development in our State for the past 100 years. Florida has about 5 percent of the population of the United States today, and we are expected to increase the population to about 15 million by the year 2000.

In addition to that, we see about 40 million visitors every year to our State. I am sure a number of you are among those visitors. I hope that you are. The State of Florida, because of that, has been extremely actively engaged in acquiring a water recharge area, floodplains, and port wetlands around the State through a number of innovative land acquisition projects. We have bought about half a million acres of environmentally endangered land, many of which are wetlands under the State conservation and reclamation lands program.

Our water management districts have recently acquired 1.6 million acres of wetlands, largely for water resources management, including water resources recharge, and I guess I would summarize by saying that over the last two decades, the State has spent three quarters of a billion dollars in land access, and in the next decade we expect to spend another billion more on land acquisition.

So we are deeply committed to protecting our water resources. So that it is clear that our State has a commitment to manage water resources, but there are still a number of problems which the State has not grappled with, that is the ability to develop and maintain storm water management systems that give us protection from floods but at the same time protect our water resources from pollution.

In fact, we estimate that about 60 percent of the pollution entering Florida's water bodies today is from nonpoint-source runoff. We have 8,000 lakes and 10,000 miles of rivers and they are all certainly threatened by nonpoint-source contamination. We feel the Federal Government and the Corps of Engineers is uniquely qualified to

assist the State because of its research, engineering, construction capability and construction management, which the State does not have to a great degree and the Corps does have.

We would like to see the Corps of Engineers assigned a new mission, to help restore and protect wetlands, estuaries and other degraded natural waters to ensure their availability for future generations. We think that this responsibility should include refitting of mainly our urban stormwater systems.

We agree and we understand that the plan of local participation must increase. We are willing to pay more than our share. However, we also see that the short-term economic benefits that are currently associated with federal funding doesn't really focus on the long-term need of protecting water resources which are extremely important and can hardly be quantified by a traditional economic means.

Let me talk briefly about the year-end review. First I want to thank you very much for the hearing that you were able to hold in Florida, and we thank the Florida delegation very much for coming to our State and creating the Cross-Florida National Conservancy Area. We deeply appreciate that, and anything that the State can do at our level to assist you in that effort you have our strong support.

Secondly, we would like to call to your attention a strange thing that seems to have happened on the way to the bank with the 1986 appropriations which you were so kind to fund. You funded $33.4 million of the project. Only 24.6 of which has found its way to Jacksonville and Mobile, and we would like to figure out somehow how that has happened. If you find out, we would like you to know that the Corps says it is due to savings in slippage. We do appreciate the Corps and don't want to criticize them, however, we don't know about that.

We would like to mention one other item with respect to cost sharing, which, again, we recognize that we do need support. Firstly, the State's position is, to the degree possible, we would like to see the Federal Government apply that cost sharing to future projects rather than past projects so we don't jeopardize completion.

The second item is that there seems to have been a growing policy to remove the Federal Government from studies because of the impression studies are studies and they don't go anywhere. We want to call your attention to a project such as the Suwannee River study, the whole purpose of which is to find out more about how the river functions so that we can keep people out of the floodplain so we don't have to come back to you in the future to request money for flood control projects. So we would request, if possible, that you have the Corps reconsider their policy with respect to studies that might go to prevent future costs that we would all have to incur. The State of Florida is more than willing to meet its commitment to adopt regulatory an other programs to be sure that suitable floodplain management is enacted.

Now let me very briefly summarize a few individual projects for you because they fall into various types.

First, Central and South Florida Water Management Project, the C-111 planning for components on C-111 is very important as a part of the Save our Everglades program.

The protection of the Herbert Hoover Dike, which is in the Lake Okeechobee, the liquid heart of south Florida, needs to be continued. There are a number of other projects with respect to that water supply and flood protection project that needs to be worked on this year.

The second issue, and one that we are very excited about, is the Upper St. Johns River Project, which I think I have spoken to you about before. It is now ready for implementation. The Corps has done a very fine general design memorandum. The State is going to be spending three quarters of the $107 million required for the total project. The general design memorandum is on its way through the Corps approval process at this time, and I hope to keep our eyes open for it. We would love to see it funded as soon as possible.

The St. Marys and Suwannee River study we have already spoken to you about. They are both aimed at exactly the kind of nonstructural protection that I described to you earlier. I think it is going to save us all money in the future. Several very important water supply studies you have heard from Mr. Hutto about: the Northwest Florida water management water supply study. We have also requested the Brevard County Suwannee with Lacoochee River Basin be included.

Navigation—in addition to being a tourist state we are really a very significant maritime state, as I am sure you are aware. We have always tried to grapple as well as we could with the issues of channel construction and spoil disposal from an environmental perspective as well as strictly navigational. And funds for the Clearwater spoil disposal study, the Millcove project Mr. Bennett discussed with you, Lower St. Johns River enhanced study, and Miami River cleanup project are all aimed toward merging environmental issues of very great significance with navigation.

We request funding for preconstruction planning on three navigation projects, Fort Pierce harbor, Mexico Beach inland port dredging project. There are some other navigation and dredging projects of great importance to the State at the Miami harbor channel, Port Everglades, Port Manatee, and Tampa harbor.

Beach erosion control, I want to spend a minute on that issue. As you know, the State has been hit extremely hard by two hurricanes last year. We already have been suffering severe erosion in Pinellas County. Those who have had opportunity to be in the St. Peterburg area recently, you probably have seen the great destruction that has occurred to the beaches there.

The State has committed a quarter of a billion dollars to the purchase and preservation of 17 miles of coastline, and we recently increased our ability to buy State beach. The State right now is undergoing in our legislature a massive request for beach renourishment at State expense. However, we have also requested funds from the Federal Government for a number of beaches including reconstruction planning for Morgan and Sarasota County beaches.

One beach program which we have supported is running into some problems in the permitting process. We hope those can be re-

solved. That is the North Boca Raton Beach Project. There are two or three other environment restoration enhancement projects that are mentioned in our remarks which I don't need to repeat to you.

I want to thank you very much for your attention and particularly thank the delegation for all their support.

Mr. WATKINS. Thank you.

[The statement of Ms. Tschinkel follows:]

PRESENTATION

TO

SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

COMMITTEE ON APPROPRIATIONS

U.S. HOUSE OF REPRESENTATIVES

BY

VICTORIA J. TSCHINKEL

SECRETARY OF THE FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION

ON BEHALF OF THE STATE OF FLORIDA

APRIL 10, 1986

Good afternoon Mr. Chairman and members of the Subcommittee. I am Victoria Tschinkel, Secretary of the Florida Department of Environmental Regulation. I am pleased to discuss with you today Florida's Fiscal Year 1987 Program for Water Resources Development. Governor Graham strongly supports this program which is a request for appropriations of 84 million dollars for 45 projects and studies. I am submitting, along with my prepared remarks, a booklet containing project descriptions, justifications and costs for the 10 flood damage prevention, 14 navigation, 16 beach erosion control, and 5 environmental restoration proposals included in the 1987 program request.

Before I begin my specific remarks about Florida's FY 87 program I would like to discuss our ideas on the need to modify overall federal policy on water resource development.

As population increases and new development continue to place more and more pressure on the nation's water resources, it is time for us all to re-examine our traditional approach to management and protection of our water resources. In Florida, the federal government has played a major role in developing its water resources for over one hundred years. Today Florida has a population of over 11 million people, 4.8% of the nation's total. This number is expected to increase to about 15 million by the year 2000. In addition, Florida plays host to almost 40 million visitors each year. Our many water resources, combined with a warm subtropical climate, are major reasons for Florida's attraction to visitors and new residents. Our tremendous population growth places heavy pressure on Florida's water resources.

In an effort to protect and conserve these water resources, Florida has been actively engaged in the acquisition of floodplains, aquifer recharge areas, and important wetlands through several innovative land acquisition programs. Our Conservation and Recreation Lands Program, for example, has led to the acquisition of approximately half a million acres of environmentally endangered lands. The state's five water management districts have recently acquired title to over 1.6 million acres of wetlands. Over the last two decades, Florida has spent three-quarters of a billion dollars for the purchase of two million acres of natural areas. We will spend over a billion dollars more in the next decade. Most of these acquisitions are for wetlands or other areas closely linked to valuable water resources. The State of Florida is deeply committed to protecting its water resources.

It is clear that strong protection and good management of our water resources are in both the state's interest and in the federal interest. Traditional management and regulatory approaches will not be adequate to insure that our natural quality of life can be sustained. For example, major urban areas will require vastly improved stormwater systems which can both prevent flood damages and provide for adequate treatment of those

waters to protect the estuaries which serve as breeding grounds for commercial seafood. Our 8,000 lakes and 10,000 miles of rivers are also in need of a basin-wide comprehensive approach to control nonpoint pollution and provide cost-effective solutions to help conserve top soil.

The Federal Government is uniquely qualified to work in partnership with the States to accomplish this goal. It has the research, engineering, and construction capability to address global problems. The Army Corps of Engineers needs to be assigned a new mission to help restore and protect wetlands, estuaries, and other degraded national waters to insure their availability for use by future generations. Its flood control responsibility should permit it to include retrofitting major urban area stormwater systems with both water quantity and quality controls.

Current concepts for defining the amount of federal participation in such projects should also be re-assessed. The selection of the alternative which maximized the net economic benefits is far too restrictive and overlooks the long term values of a protected or restored water resource. The State of Florida stands ready to work closely with the Federal Government in this endeavor.

Along more traditional lines, Congress has appropriated, over the last five years, $500 million for civil works projects and studies in Florida. These have yielded great benefits to both Florida and the nation. For this we thank you. We hope you will continue to strongly support the development of water resource projects. In view of the pending budget reductions, we must emphasize that our program represents our basic needs and highest priorities. It includes only 45 of the 59 proposals originally submitted to us.

Year in Review

Each year we come before you and present our program and funding requests. I would like to review some of the significant events and policies that have shaped or affected our program since I spoke to you last year.

Cross Florida National Conservation Area

First, I would like to take this opportunity to thank the Florida delegation and the Public Works and Transportation Committee for conducting a public hearing on the Cross Florida Barge Canal. We applaud the efforts of Congress to deauthorize further construction and to maintain the presently-constructed areas as a conservation area. A resolution to this effect is included in the Appendix of our booklet. We know that this Subcommittee is responsible for any appropriations necessary for the Conservation Area and commend it to you also.

FY 1986 Appropriations

Our FY 86 Program requested funding for 42 projects. Congress appropriated funds for 20 projects totalling $33.4 million. However, allocations to the Corps' offices in Florida amounted to only $24.6 million for 19 projects. The Corps attributes the $8.8 million dollar difference between the amount appropriated and actual allocations to "saving and slippage". We hope that we will not face this situation with the FY 1987 program.

Cost-Sharing

With the passage of the Gramm-Rudman-Hollings Deficit Reduction Action and current Administration policies, we anticipate a higher non-federal percentage of cost-sharing for our studies and projects. As a general policy, we believe that any changes in cost-sharing formulas which would increase state and local contributions should not apply to existing projects. We have, in the past, made contributions which are substantially higher than average to Army Corps of Engineers studies and projects.

We are very concerned that budget restrictions will narrow the focus of future projects and studies. The Corps should not be limited to studies which result in the construction of projects. Many studies result in solutions which will clearly help to protect the necessity for costly federal projects in the future. Floodplain management studies, like the Suwannee River Study for example, are very cost effective because they help the local sponsors develop policies and strategies which minimize the need for structural projects. For years, we have been stressing non-structural solutions to flood control and other water management problems over structural alternatives and the Corps has assisted us with these efforts.

More fundamental is the concern we have with the planning objectives of the whole public works program, as determined by the Administration. As I have already mentioned, we feel that National Economic Development and Environmental Quality should both be goals for public works projects and studies rather than National Economic Development alone as in the current "Principles and Guidelines". National policy must recognize the diverse goals of water resource management.

We also hope that higher local cost shares in planning studies will mean greater state and local participation in all aspects of Corps studies including the selection of alternatives.

Individual Projects

I would like to discuss some of the individual projects contained in our program. Again, they are in the categories of flood damage protection, navigation, beach restoration and environmental restoration and enhancement.

Flood Damage Prevention and Water Supply

Full funding is needed for one of the nation's largest and most complex water management systems: the Central and South Florida project. The project provides flood and hurricane protection and much-needed agricultural water supply. It affects the environment of much of south Florida, including Everglades National Park. Adequate appropriations for the C&SF Project are critical to the success of Florida's far-reaching program to "Save Our Everglades".

FY 87 funds will be used to continue planning for components such as C-111, which requires redesign to protect Everglades National Park. Funds will also permit continued work on the protection of Herbert Hoover Dike around Lake Okeechobee and the reconstruction of Hurricane Gates on the Lake.

A major component of the Central and South Florida Project is the Upper St. Johns River Project, which is now ready for implementation. We are very pleased with the draft General Design Memorandum issued last year and hope the Chief of Engineers will approve it very soon. The project will reduce flood damages and increase water supplies, while enhancing the natural environment. The St. Johns River Water Management District is using local property taxes to generate revenues for land purchases. Three-quarters of the $107 million project cost will be assumed by the local sponsor.

Many millions of dollars have been invested in the Four River Basins Flood Control Project. The FY 87 request is for federal matching funds to complete construction of an authorized wilderness recreation site.

Congress appropriated funds for water management studies of two undeveloped river basins -- the St. Marys and Suwannee Rivers. Continued funding would complement local and state efforts to preserve and protect these rivers and to provide flood protection. Adequate funding this year for the Suwannee River Study would bring it to completion.

Our program includes proposals for several water management and water supply studies -- for the areas of Broward County, coastal northwest Florida and for the St. Johns and Withlacoochee River Basins.

Navigation

The efficiency of its navigation is of prime importance to Florida as it is one of the nation's leading maritime states with ports whose influence is felt both regionally and nationally. The State of Florida is very interested in working with the Corps to improve the water quality in its ports and to minimize the negative environmental impacts of channel construction and spoil disposal from navigation projects. Funds for the Clearwater Spoil Disposal Study, Mill Cove Project, Lower St. Johns River

Enhancement Study and Miami River Cleanup Project would be used for this purpose.

Our program also requests funding for preconstruction planning for three projects -- Ft. Pierce Harbor, Mexico Beach Inlet, and the Port of St. Petersburg Dredging Project. Other projects involving dredging and other navigation improvements are proposed for the Miami Harbor Channel, Port Canaveral, Port Everglades, Port Manatee and Tampa Harbor. Navigation improvement feasibility studies are proposed for the Jupiter Inlet and for Port Canaveral. All of these should contribute substantially to National Economic Development.

Beach Erosion Control

When people think of Florida, the image of a beach often comes to mind. Beaches are, by far, the largest attraction for the 40 million people who visit Florida each year. We have over 775 miles of coastline with sandy beaches in Florida. Over 140 miles are experiencing critical erosion.

This past fall, our Gulf Coast beaches were hit hard by the back-to-back hurricanes, Elena and Kate. This exacerbated an already serious situation in areas such as Pinellas County where miles of coastline are altogether devoid of beaches.

In Florida, we take our beaches as seriously as we do hurricanes. We have committed a quarter of a billion dollars to the state's Save Our Coast Program to purchase and preserve 17 miles of coastline. Additionally, over $30 million dollars has been spent by the state since 1965 on beach restoration projects. Federal assistance plays a critical role in the management of our coasts.

Our FY 87 request is for several beach restoration projects, preconstruction planning for Monroe and Sarasota County beaches, and for three studies including a statewide investigation of coastal processes. The North Boca Raton Beaches request has been included in our program on the condition that if funds are appropriated, permit concerns must be resolved.

Environmental Restoration and Enhancement

As I mentioned earlier, one of our major goals is to broaden the scope of Federal participation to include studies and projects that result in the restoration and enhancement of water resources. These projects are important to our state since our economy and the essence of Florida itself depends on maintaining high environmental quality.

Two of the studies included in our program -- Biscayne Bay and Six Mile Cypress -- are authorized and previously funded, yet no

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funds were included in the President's FY 86 budget. We urge you to accelerate these studies.

Funds are also requested for the restoration of Banana Lake in Polk County and for recreation improvements in Broward County and the City of Jacksonville. For these two latter projects, funds could come directly from the Corps of Engineers' Code 710 recreational development program, if funds were appropriated.

Conclusion

This concludes my remarks. Thank you for the opportunity to present the Florida Program of Public Works to you.

PUBLIC WORKS APPROPRIATIONS

FOR FISCAL YEAR 1987

River & Harbor -- Flood Damage Prevention -- Shore Protection
Environmental Restoration & Enhancement

Statement of
State of Florida
Department of Environmental Regulation
to the
Committee on Appropriations
United States Congress

LOCATION MAP

FY 87

PUBLIC WORKS PROGRAM

STATE OF FLORIDA
FY 1987 PUBLIC WORKS PROGRAM

Study or Project	Request	Page
FLOOD DAMAGE PREVENTION (AND WATER SUPPLY)		
1. Broward County Comprehensive Water Management Plan	$ 200,000	5
2. Central and Southern Florida Flood Control Project	15,000,000	7
3. Four River Basins Project	1,200,000	9
4. Northwest Florida Coastline: Groundwater Management	1,000,000	11
5. St. Johns River Basin Water Quality Management	450,000	13
6. St. Marys River Basin Floodplain	375,000	15
7. Suwannee River	768,000	17
8. Tampa Bay Region Hurricane Refuge Alternatives	207,000	20
9. Upper St. Johns Project		21
10. Withlacoochee River Regional Water Supply	200,000	23
NAVIGATION		
11. Clearwater Spoil Disposal	177,000	27
12. Fort Pierce Harbor	90,000	29
13. Jupiter Inlet	100,000	31
14. Lower St. Johns River Enhancement	200,000	33
15. Mexico Beach Inlet	200,000	35
16. Miami Harbor Channel	250,000	37
17. Miami River Cleanup	183,000	39
18. Mill Cove (Jacksonville Harbor)	2,000,000	41
19. Port Canaveral Project	3,100,000	43
20. Port Canaveral	50,000	45
21. Port Everglades	50,000	47
22. Port Manatee Project	12,710,000	49
23. Port of St. Petersburg Basin/Channel Dredging Project	75,000	51
24. Tampa Harbor Deepening Project	7,400,000	53
BEACH EROSION CONTROL		
25. Brevard County Beaches	154,000	57
26. Broward County Beaches (John U. Lloyd State Beach Recreation Area)	4,000,000	59
27. Cape Canaveral Beach Renourishment	1,000,000	61
28. Captiva Island Beach Nourishment	20,000	63
29. Dade County Beaches	2,000,000	65
30. Dade County Beaches-North of Haulover Beach Park	6,000,000	67
31. Duval County Beach Renourishment	3,200,000	69
32. Flagler County Beach Erosion Control	115,000	71
33. Florida Statewide Beaches	1,525,000	73
34. Fort Pierce Beach	650,000	75
35. Indian River County Beach Nourishment: Sebastian Inlet Component	804,000	77
36. Indian River County Beach Nourishment: Vero Beach Component	1,756,000	79
37. Monroe County Beach Erosion Control	93,000	81
38. North Boca Raton Beach Restoration	1,700,000	83
39. Pinellas County	12,194,400	85
40. Sarasota County Beaches (Venice/Caspersen Beach)	479,000	87
ENVIRONMENTAL RESTORATION AND ENHANCEMENT		
41. Ballard Park Boat Ramps and Accessibility Improvements	500,000	91
42. Banana Lake Restoration Feasibility	100,000	93
43. Biscayne Bay Survey Review	675,000	95
44. Jacksonville Metropolitan Park	100,000	97
45. Six Mile Cypress	100,000	99

APPENDIX

Governor and Cabinet Resolutions-Cross Florida Barge Canal

* Funding for the Upper St. Johns Project would be included in the appropriation for the overall Central and Southern Florida Project.

Flood Damage Prevention
(and Water Supply)

1. Broward County Water Mgmt.
2. Central and Southern Florida Flood Control Project
3. Four River Basins
4. Northwest Florida Water Supply
5. St. Johns River Basin Water Quality Management Plan
6. St. Marys River
7. Suwannee River
8. Tampa Bay Refuge Alternatives
9. Upper St. Johns
10. Withlacoochee River Regional Water Supply

FLOOD DAMAGE PREVENTION (AND WATER SUPPLY)

Broward County Comprehensive Water Management Plan

Central and Southern Florida Flood Control Project

Four River Basins Project

Northwest Florida Coastline: Groundwater Management

St. Johns River Basin Water Quality Management

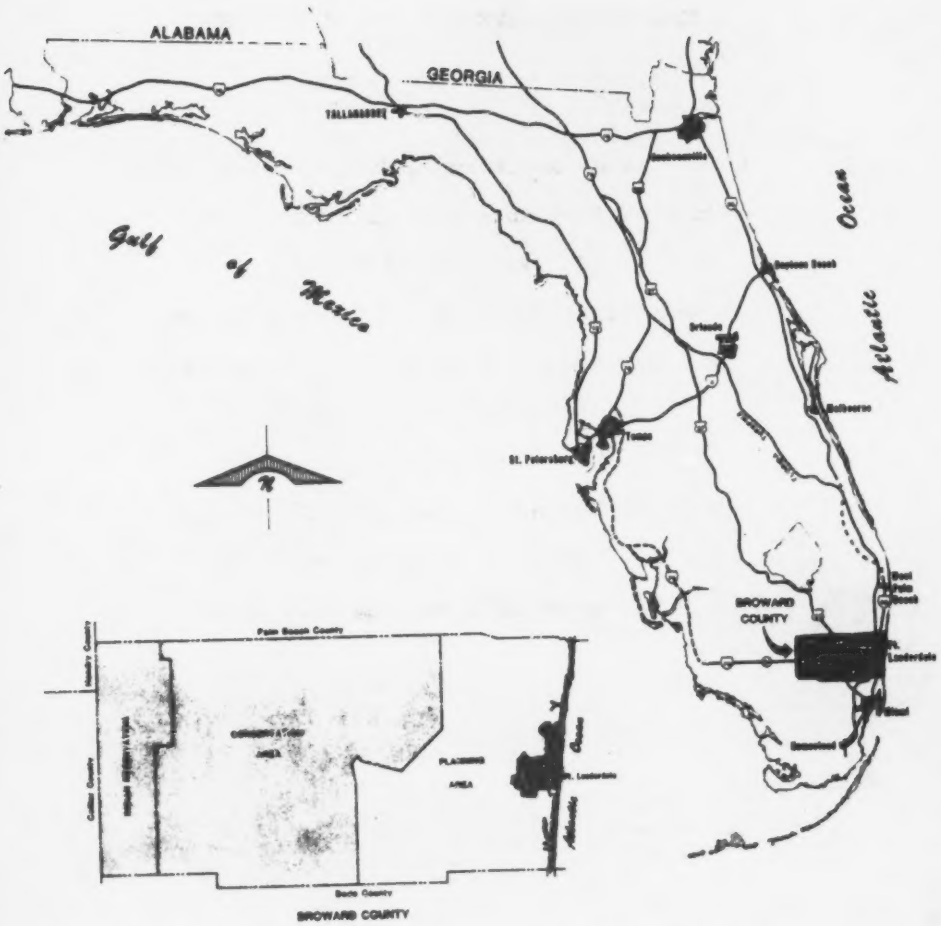
St. Marys River Basin Floodplain

Suwannee River

Tampa Bay Region Hurricane Refuge Alternatives

Upper St. Johns Project

Withlacoochee River Regional Water Supply


ALABAMA
GEORGIA
Gulf of Mexico
Atlantic Ocean
BROWARD COUNTY
Palm Beach County
Dade County
BROWARD COUNTY

Broward County Comprehensive Water Management Plan
(Study)

Estimated Federal Cost	To Be Determined
Estimated Non-Federal Cost	To Be Determined
Federal Funds Through FY 86	0
Non-Federal Funds Through FY 86	0
President's Budget	0
State of Florida Request FY 87	$200,000

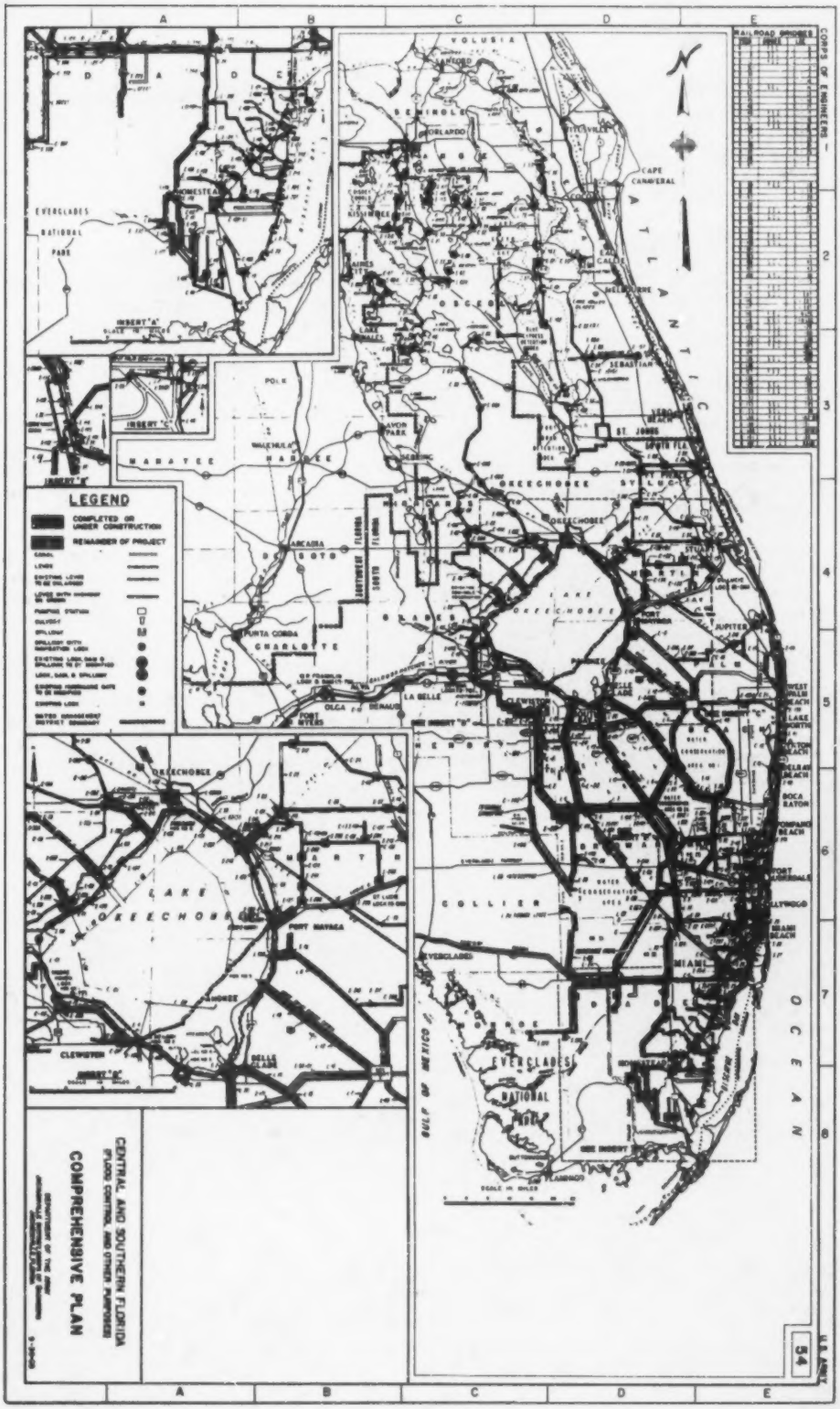
Project History/Description

Broward County is experiencing rapid growth, which is exacerbating flood control and water supply problems. As the local sponsor, Broward County is seeking assistance from the Army Corps of Engineers for its current planning efforts which include: 1) protecting the sole-source Biscayne Aquifer from surface pollution and salt-water intrusion, 2) developing methods for increasing water supply and decreasing demand through conservation, and 3) planning and designing structures for water control and supply. The study is not yet authorized.

As part of the Central and Southern Florida project authorized by Congress, the Corps of Engineers has studied this area at a regional level. Assistance is requested from the county to address specific county-wide concerns. Funding of $200,000 is requested which would be used to: 1) identify sources of treated wastewater effluents acceptable for use in creating a non-saline barrier, 2) selecting recharge/irrigation sites, 3) plan, design, and project the future costs of water supply/flood control structures, and 4) to analyze water quality.

Project Justification

The project would provide the following benefits to Broward County: 1) insure a continued supply of unpolluted, potable water to county residents and visitors, 2) provide flood protection, and 3) allow for the scheduled development of future water resources construction and water supply facilities.


LEGEND
COMPLETED OR UNDER CONSTRUCTION
REMAINDER OF PROJECT
CENTRAL AND SOUTHERN FLORIDA
FLOOD CONTROL AND OTHER PURPOSES
COMPREHENSIVE PLAN
ATLANTIC OCEAN
GULF OF MEXICO
EVERGLADES NATIONAL PARK
LAKE OKEECHOBEE
VOLUSIA
BROWARD
DADE
COLLIER
HENDRY
GLADES
MARTIN
PALM BEACH
OKEECHOBEE
ST LUCIE
INDIAN RIVER
BREVARD
ORANGE
OSCEOLA
POLK
HIGHLANDS
HARDEE
MANATEE
SARASOTA
CHARLOTTE
LEE
MIAMI
FORT LAUDERDALE
WEST PALM BEACH
JUPITER
BOCA RATON
54

Central and Southern Florida Flood Control Project
(Construction, Continuing Planning and Enginering)

Estimated Federal Cost	$767,000,000
Estimated Non-Federal Cost	431,465,000
Federal Funds Through FY 86	296,296,000
Non-Federal Funds Through FY 86	55,380,000
President's Budget	15,000,000
State of Florida Request FY 87	15,000,000
Benefit Cost Ratio: 5.1 to 1	

Project History/Description

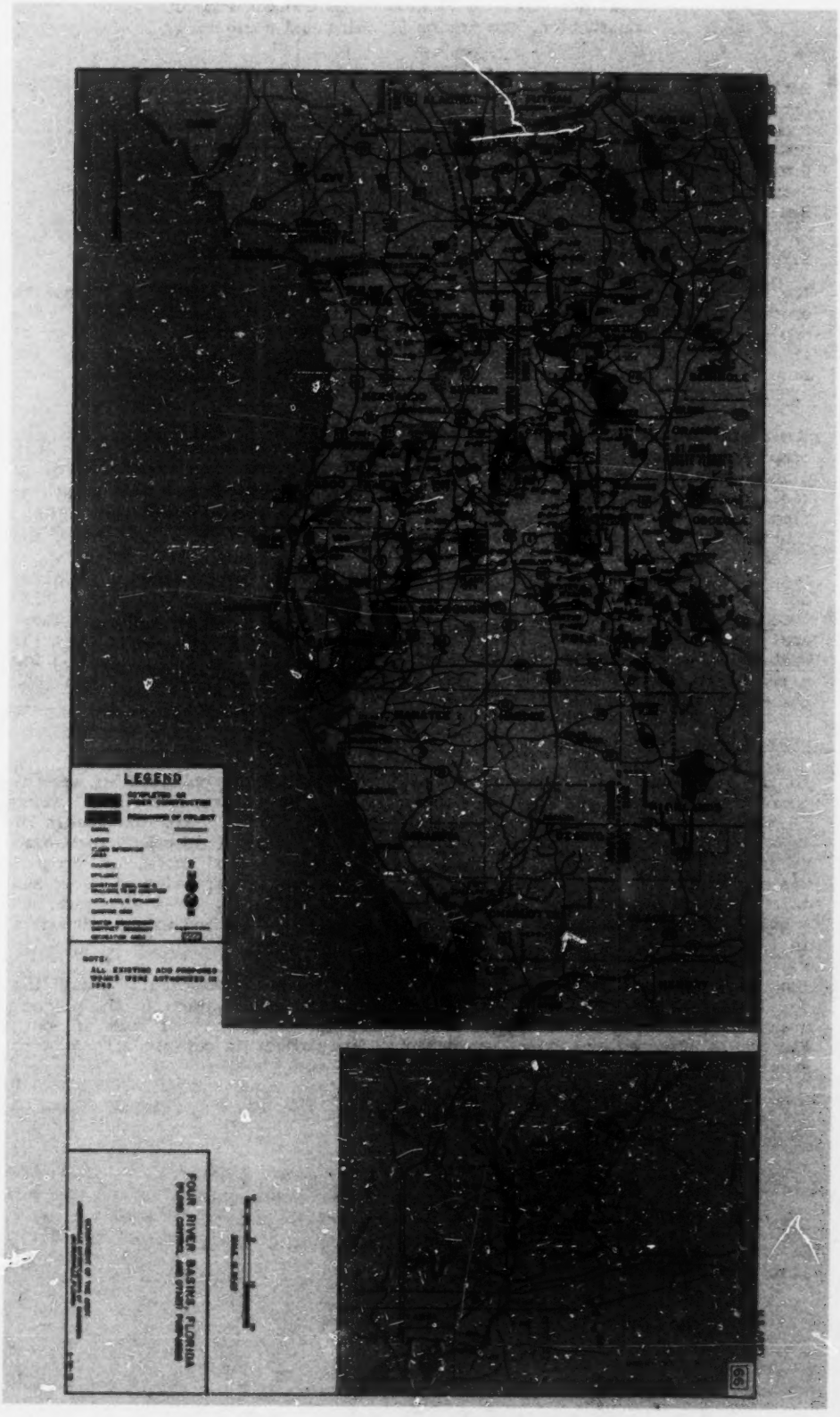
The Central and Southern Florida Flood Control Project (C&SFFCP) is a massive system of water control works first authorized by Congress in 1948. The project area encompasses approximately 17,930 square miles over all or part of 16 counties and includes the Kissimmee River Basin, Lake Okeechobee and its regulatory outlets, a large portion of the Everglades, and the lower east coast of Florida.

The South Florida Water Management District has requested the following project components for FY 86: (1) C-111/South Dade Flood Control Projects. This planned modification of an existing canal is intended to restore natural water regimes to part of Everglades National Park without lowering existing levels of flood protection for other areas. (2) Protecting the Herbert Hoover Dike. Continuation of Herbert Hoover Dike Revetment Construction will protect the integrity of the existing dike from erosive wind and wave action at the upper regulation stage. (3) St. Lucie County Water Supply. FY 87 funds would allow design work for C-131 (St. Lucie County Irrigation Water Supply). (4) Reconstruction of Hurricane Gates 3, 4 and 5 and Pump Stations 6 and 9. These are purely replacement works and involve no change in project operation. (5) Western C-51 Project. This is a controversial proposal for FY 87 planning for a new flood control pump station at the north end of Conservation Area 1 and the enlargement of the western part of the C-51 canal.

Project Justification

In the first half of this century, heavy seasonal rains combined on several occasions with the passage of hurricanes to cause extensive long-lasting flooding. The C&SFFCP and its local sponsor, the SFWMD, are the result of Federal and State responses to the severe flooding of 1947. South Florida also experiences periodic severe droughts, and, as was mentioned above, the project was expanded in 1968 to include increased storage and conservation of water and improved distribution of water throughout the project area. This expansion has acquired greater importance as a result of floods in 1982 and extreme droughts in 1971 and 1981.

The population of South Florida continues to grow dramatically, and the potential benefits of both flood control and water conservation in the project area are increasing accordingly. The environmental quality of much of South Florida is affected by project management. The project is capable of providing essential water management for South Florida.


LEGEND
NOTE:
FOUR RIVER BASINS, FLORIDA

Four River Basins Project
(Construction)

Estimated Federal Cost	$187,000,000
Estimated Non-Federal Cost	131,820,000
Federal Funds Through FY 86	69,574,000
Non-Federal Funds Through FY 86	12,706,000
President's Budget	1,200,000
State of Florida Request FY 87	1,200,000
Benefit Cost Ratio: 1.8 to 1	

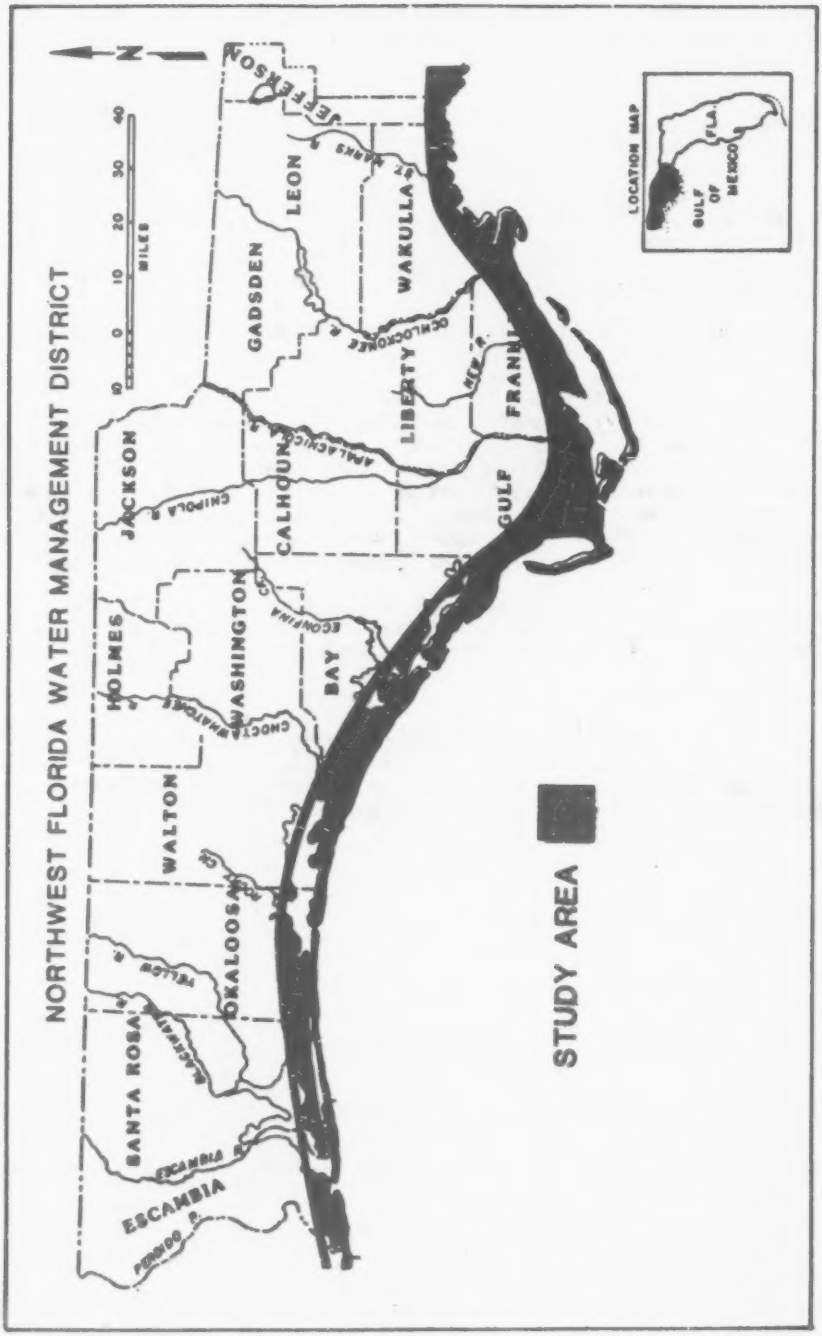
Project History/Description

The Four River Basins Project, sponsored by the Southwest Florida Water Management District, has been under construction since 1966 to provide flood protection for an area of approximately 6,000 square miles in 14 counties of central and southwest Florida. It includes part of the drainage basins of four major streams - the Hillsborough, Oklawaha, Withlacoochee, and Peace Rivers - and three smaller west coast watersheds - Pithlachascotee River, Anclote River and Lake Tarpon. The authorized plan includes numerous works in several parts of the project area. Some major components of the project have been completed, including the Tampa Bypass Canal, the Lake Tarpon Outfall Canal, the Masaryktown Canal and the Tsala Apopka Outfall Canal, along with related water control structures, railroad bridges, highway bridges and various relocations.

The FY 87 request is for continued construction of the Lower Hillsborough Wilderness Park at the Tis-a-wa and Trout Creek Sites.

Project Justification

This facility is located close to the Tampa Metropolitan area and is a regional recreation resource. The further recreational development of the Lower Hillsborough Wilderness Park will allow greater use of the major land resources acquired as part of the Four River Basins Project.


NORTHWEST FLORIDA WATER MANAGEMENT DISTRICT
N
0 10 20 30 40
MILES
JEFFERSON
LEON
GADSDEN
WAKULLA
LIBERTY
FRANK
GULF
CALHOUN
JACKSON
HOLMES
WASHINGTON
BAY
WALTON
OKALOOSA
SANTA ROSA
ESCAMBIA
LOCATION MAP
FLA.
GULF OF MEXICO
STUDY AREA

Northwest Florida Coastline: Groundwater Management Strategies
(Study)

Estimated Federal Cost	$3,200,000
Estimated Non-Federal Cost	0
Federal Funds Through FY 86	0
Non-Federal Funds Through FY 86	0
President's Budget	0
State of Florida Request FY 87	1,000,000

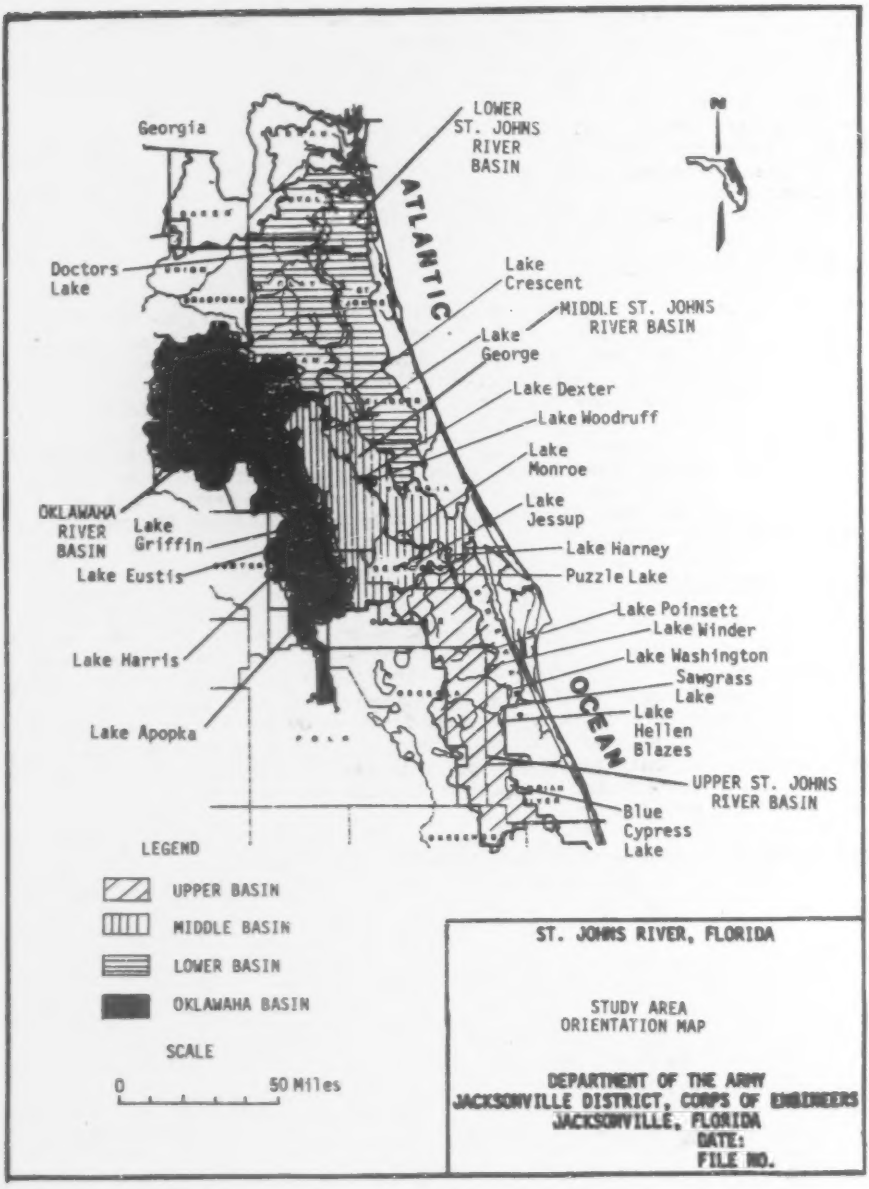
Project History/Description

The Northwest Florida Water Management District has requested funding to develop a management plan/strategy for groundwater quality and quanity in coastal areas of Northwest Florida. This study would include construction of test monitoring wells along the coast. These wells will provide information to: 1) locate and map the fresh/salt water interface in the Floridan aquifer, 2) determine, based on configuration of saltwater interfaces, availability for public supply and other uses, and 3) assist in refining existing groundwater quality and quantity management plans and regulations to more accurately reflect existing groundwater conditions and potential change. These wells will be incorporated into the existing monitoring programs of the Northwest Florida Water Management District.

Project Justification

Population in the coastal areas has increased very rapidly in the last ten years, and the number of tourists visiting areas from Panama City Beach to Pensacola has also rapidly increased. The resultant demand for water during the summer months now equals the full capacity of most public water supply systems. Thus, there is an acute need for a study to provide water managers with the information needed to meet these increasing demands for water. The Department of Community Affairs supports the study and find it consistent with the Governor's concern for the protection and provision of an adequate water supply to Northwest Florida.

Congressional study authorization is needed.


Georgia
LOWER ST. JOHNS RIVER BASIN
ATLANTIC
OCEAN
Doctors Lake
Lake Crescent
MIDDLE ST. JOHNS RIVER BASIN
Lake George
Lake Dexter
Lake Woodruff
Lake Monroe
Lake Jessup
Lake Harney
Puzzle Lake
Lake Poinsett
Lake Winder
Lake Washington
Sawgrass Lake
Lake Hellen Blazes
UPPER ST. JOHNS RIVER BASIN
Blue Cypress Lake
OKLAWAHA RIVER BASIN
Lake Griffin
Lake Eustis
Lake Harris
Lake Apopka
LEGEND
UPPER BASIN
MIDDLE BASIN
LOWER BASIN
OKLAWAHA BASIN
SCALE
0
50 Miles
ST. JOHNS RIVER, FLORIDA
STUDY AREA
ORIENTATION MAP
DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
DATE:
FILE NO.

St. Johns River Basin Water Quality Management
(Study)

Estimated Federal Cost	$1,319,000
Estimated Non-Federal Cost	0
Federal Funds Through FY 86	100,000
Non-Federal Funds Through FY 86	0
President's Budget	0
State of Florida Request FY 87	450,000

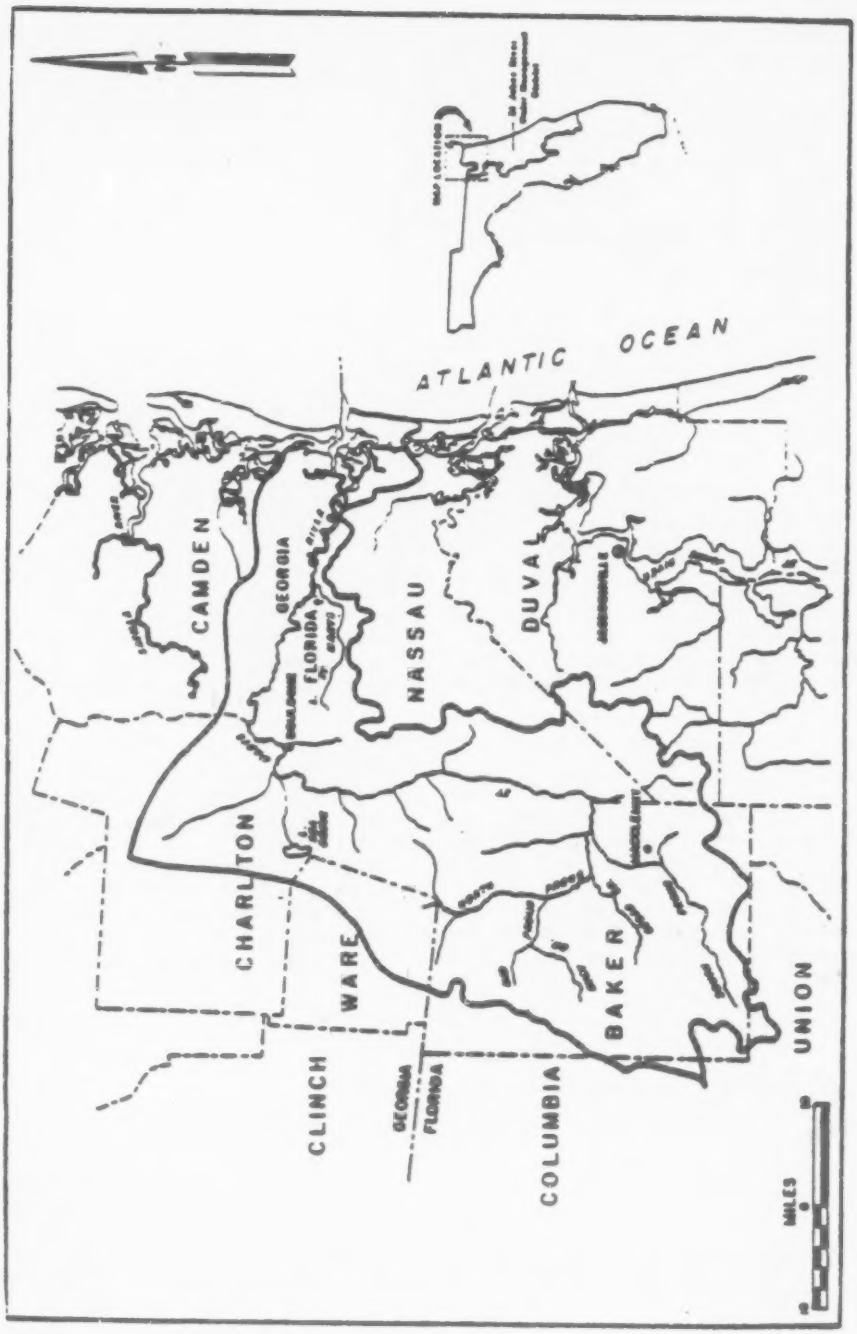
Project History/Description

Continuation of this study is proposed by the St. Johns River Water Management District. The study was authorized by language in the FY 84 Public Works appropriations bill, directing the Army Corps of Engineers to prepare "an interim water quality management plan for the St. Johns River Basin, Florida...at full federal expense and in cooperation with local interests." An appropriation of $100,000 was made for this purpose in FY 84; there was not a subsequent FY 85 or FY 86 appropriation. An amount of $450,000 is requested for FY 87.

The study will provide a plan for the improvement of water quality in the St. Johns River. Available water quality data are currently being collected and reviewed. Land use mapping will be one component of this effort. The need for changes or enlargements in the current monitoring program is being assessed. Eventually, the study will establish water quality goals for the basin, determine whether they are fulfilled in the various lake and stream segments, and recommend means of attaining these goals wherever possible. The Corps is working cooperatively with the St. Johns River Water Management District in this study.

Project Justification

The water quality of the St. Johns River has had many problems, as demonstrated by numerous fishkills, algae blooms, and citizen complaints. This study, along with information obtained from an ongoing multi-agency study of diseased fish in the lower reaches of the river, will develop an overall plan to address these problems. The result will provide important benefits to regional economics, aesthetics, and recreation. Fishery resources available for both commercial and sport uses should be enhanced from improved water quality management. Another benefit could be reduced expenditures for control of aquatic weeds.



St. Marys River Basin

St. Marys River Basin Floodplain
(Study)

Estimated Federal Cost	$1,075,000
Non-Federal Cost	475,000
Funds Through FY 86	700,000
Non-Federal Funds Through FY 86	0
President's Budget	250,000
Florida Request FY 87	375,000

Project History/Description

The St. Johns River Water Management District (SJRWMD) is proposing continuation of funding for a study of proper floodplain management in the St. Marys River Basin. The St. Marys River forms, for most of its length, the northeastern boundary of the State of Florida and drains about 1500 square miles. About 540 square miles of the basin are in Georgia.

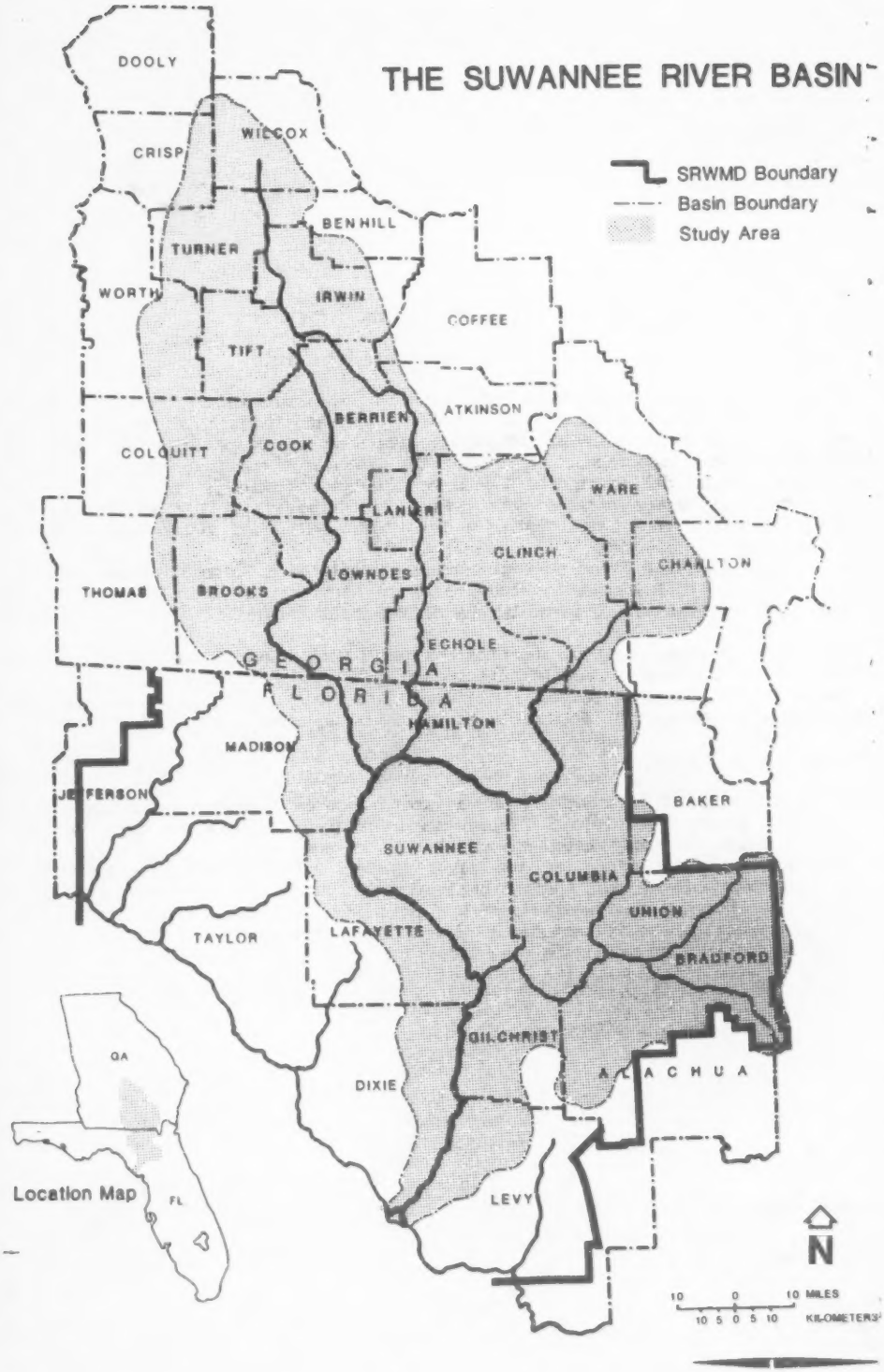
The District hopes to obtain a wide variety of useful information from the study including compilation of existing data; accurate identification and field verification of all subbasins within the watershed and preparation of a mylar base map series; topographic mapping of the 100-year floodplain at a two-foot contour interval; delineation of 2-year and 100-year floodways and floodplains within main tributary streams; analysis of existing streamflow and rainfall monitoring networks; and creation of a basin-wide, watershed management model.

The Savannah District Corps of Engineers has completed a Reconnaissance Report for the St. Marys River Basin study based on work completed in FY 84. This report was received and reviewed by the SJRWMD in January 1985.

Although not a formal part of the proposal for a Corps' study, the SJRWMD hopes that the effort will improve interagency and interstate coordination for management of the St. Marys. Ultimately, formal or informal interstate agreements for management of the St. Marys may be devised.

Project Justification

This study would significantly improve water resource planning and management in the St. Marys River Basin. The basin would benefit from the first water resource baseline study ever undertaken in it and future problems may be prevented. The hydrology of the river system would be better understood and management of the basin would be improved. Flood damage costs could be reduced and human lives saved from disruption. Also, environmental changes such as structural modifications in the drainage system may be minimized by using the information gained in the study.


THE SUWANNEE RIVER BASIN
SRWMD Boundary
Basin Boundary
Study Area
DOOLY
CRISP
WILCOX
BEN HILL
TURNER
WORTH
IRWIN
COFFEE
TIFT
ATKINSON
BERRIEN
COOK
COLQUITT
WARE
LANIER
CLINCH
CHARLTON
THOMAS
BROOKS
LOWNDES
ECHOLS
GEORGIA
FLORIDA
HAMILTON
MADISON
JEFFERSON
BAKER
SUWANNEE
COLUMBIA
UNION
TAYLOR
LAFAYETTE
BRADFORD
GILCHRIST
ALACHUA
DIXIE
LEVY
GA
FL
Location Map
N
10 0 10 MILES
10 5 0 5 10 KILOMETERS

851

Suwannee River
(Study)

Estimated Federal Cost	$1,648,000
Estimated Non-Federal Cost	0
Federal Funds Through FY 86	880,000
Non-Federal Funds Through FY 86	0
President's Budget	0
State of Florida Request FY 87	768,000

Project History/Description

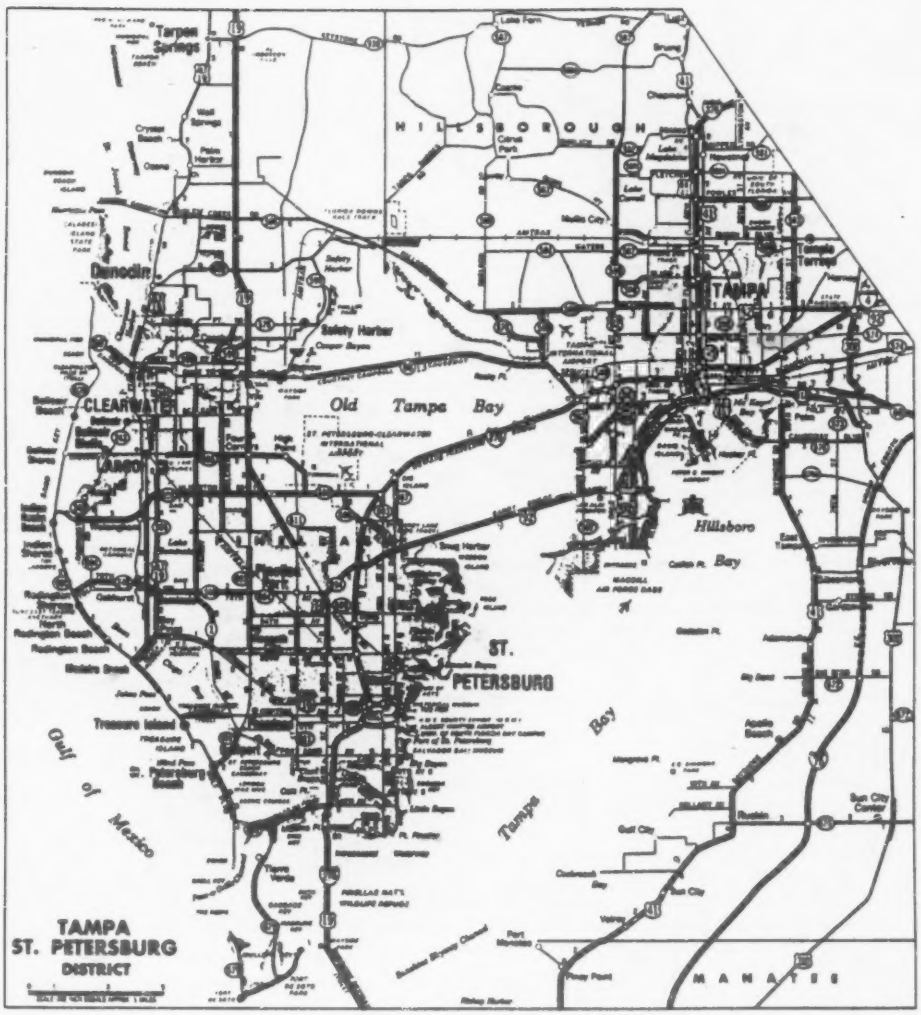
Completion of this study is requested by the Suwannee River Water Management District. The purpose of the study is to develop specific nonstructural programs for minimizing flood damages. The requested funds will be used to continue to develop and implement programs designed to ascertain recharge areas; protect surface and groundwater uses for water supply, irrigation, and pollution abatement; and to maximize environmental quality for fish and wildlife propagation. The study is also investigating, in much less detail, programs on scenic quality, recreation, and small boat navigation for the Suwannee and its tributaries.

Recent State actions include the redesignation of the Upper Suwannee as an Outstanding Florida Water and the work of the Suwannee River Resource Planning and Management Committee. This committee was appointed by Governor Graham and soon developed fifty-seven specific recommendations to address problems in the Suwannee Basin. The committee then developed a model floodplain ordinance that now has been adopted by all of the Florida counties along the river. Also, the state's "Save Our Rivers" Program is purchasing important acreage in the Suwannee watershed.

Project Justification

Three floods of 100-year magnitude have occurred on the Suwannee over the past 35 years. The 100-year flood level has been exceeded on about 50% of the river floodplain at least once since 1947. A 1973 flood caused $8 million in damage claims, while a flood in spring of 1984 caused $2.4 million in damages.

All parties now agree that identification, protection, and management of the river and its associated resources are essential. This study would contribute substantially to those goals. The study is providing information needed to adequately protect the river and its floodplain resources.


Tarpon Springs
HILLSBOROUGH
Dunedin
TAMPA
Safety Harbor
CLEARWATER
Old Tampa Bay
LARGO
Hillsboro
Bay
ST.
PETERSBURG
Bay
Treasure Island
St. Petersburg Beach
Gulf of Mexico
Tampa
Gulf City
Sun City
Sun City Center
Port Manatee
MANATEE
TAMPA
ST. PETERSBURG
DISTRICT

Tampa Bay Region Hurricane Refuge Alternatives
(Study)

Estimated Federal Cost	$284,000
Estimated Non-Federal Cost	0
Federal Funds Through FY 86	75,000
Non-Federal Funds Through FY 86	0
President's Budget	0
State of Florida Request FY 87	207,000

Project History/Description

The Tampa Bay region, on the central Gulf Coast of Florida, is highly urbanized with two large cities—St. Petersburg and Tampa—located on opposite sides of the bay. The close approach of Hurricane Elena during the Labor Day weekend of 1985 emphasizes the importance of investigating all means of reducing hazards to life and property. Under present conditions, hurricane warnings do not provide sufficient lead time to evacuate vulnerable residential areas. A possible means to alleviate this problem is to evacuate some residents into higher floors of certain buildings instead of attempting to completely evacuate all vulnerable residents. This could help prevent disastrous traffic jams on the major roads leading to safe inland areas.

Project Justification

Vertical evacuation might shorten the total time needed for evacuation. The National Hurricane Center currently strives to provide 12 hours of warning that a hurricane is expected to strike a particular area. However, the Tampa Bay area now requires 20 to 28 hours to successfully evacuate all residents to safe shelter. The additional time that might be gained from implementation of a vertical evacuation scheme might, therefore, be critical in a situation when a hurricane actually strikes. Having additional time also might prevent unnecessary evacuations. This concept, if proved successful, could be applied to other areas where sturdy high-rise structures are available.

Upper St. Johns Project
(Construction)

Estimated Federal Cost
Estimated Non-Federal Cost
Federal Funds Through FY 86
Non-Federal Funds Through FY 86
President's Budget
State of Florida Request FY 87
Benefit Cost Ratio:

Cost figures for this project are included in those for the Central and Southern Florida Flood Control Project

Project History/Description

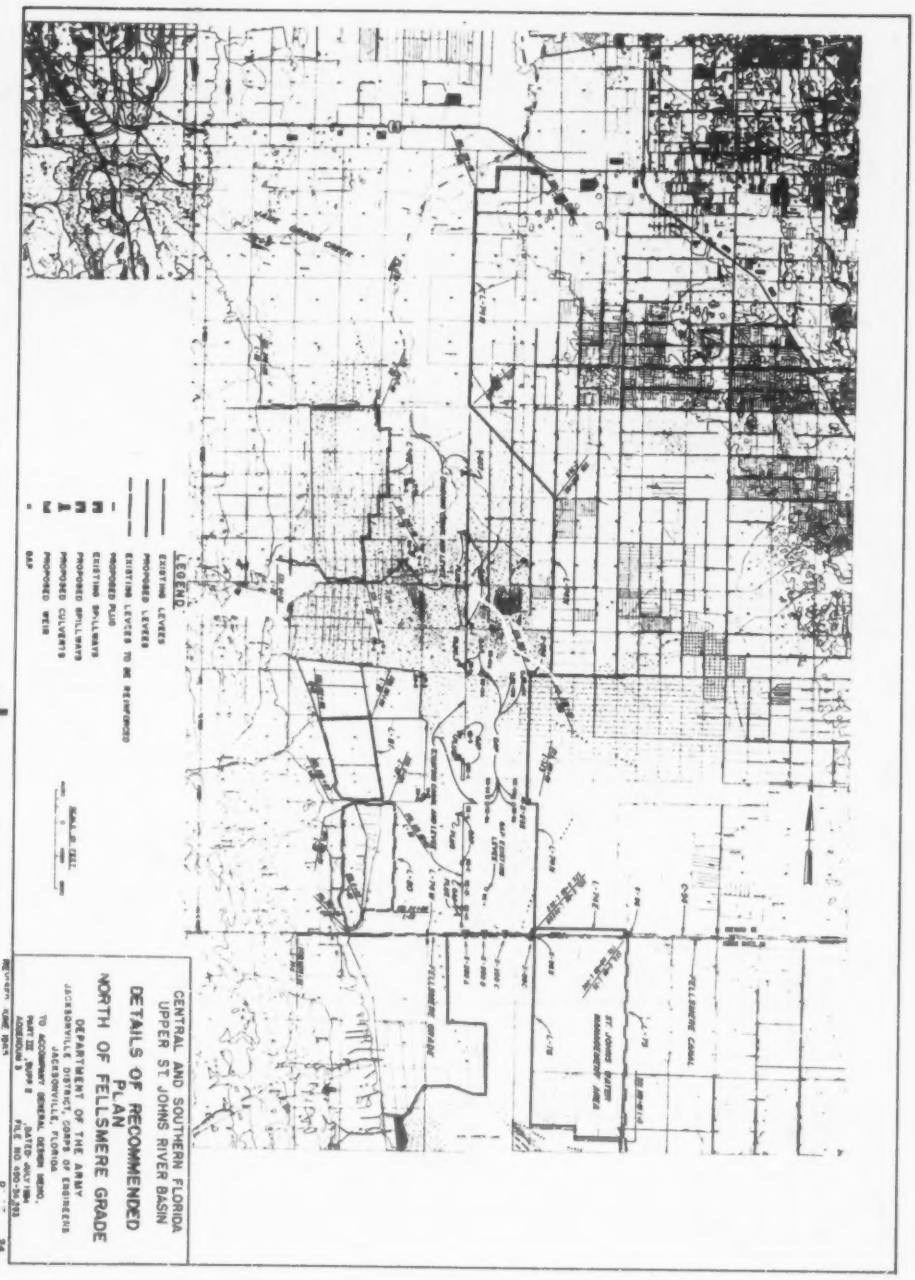
The project area of the Upper St. Johns River Basin in east-central Florida encompasses some 2,000 square miles and consists of some 60 individual contributing subbasins. In 1974, the original General Design Memorandum was deemed unacceptable to the State, primarily for environmental reasons, and was shelved.

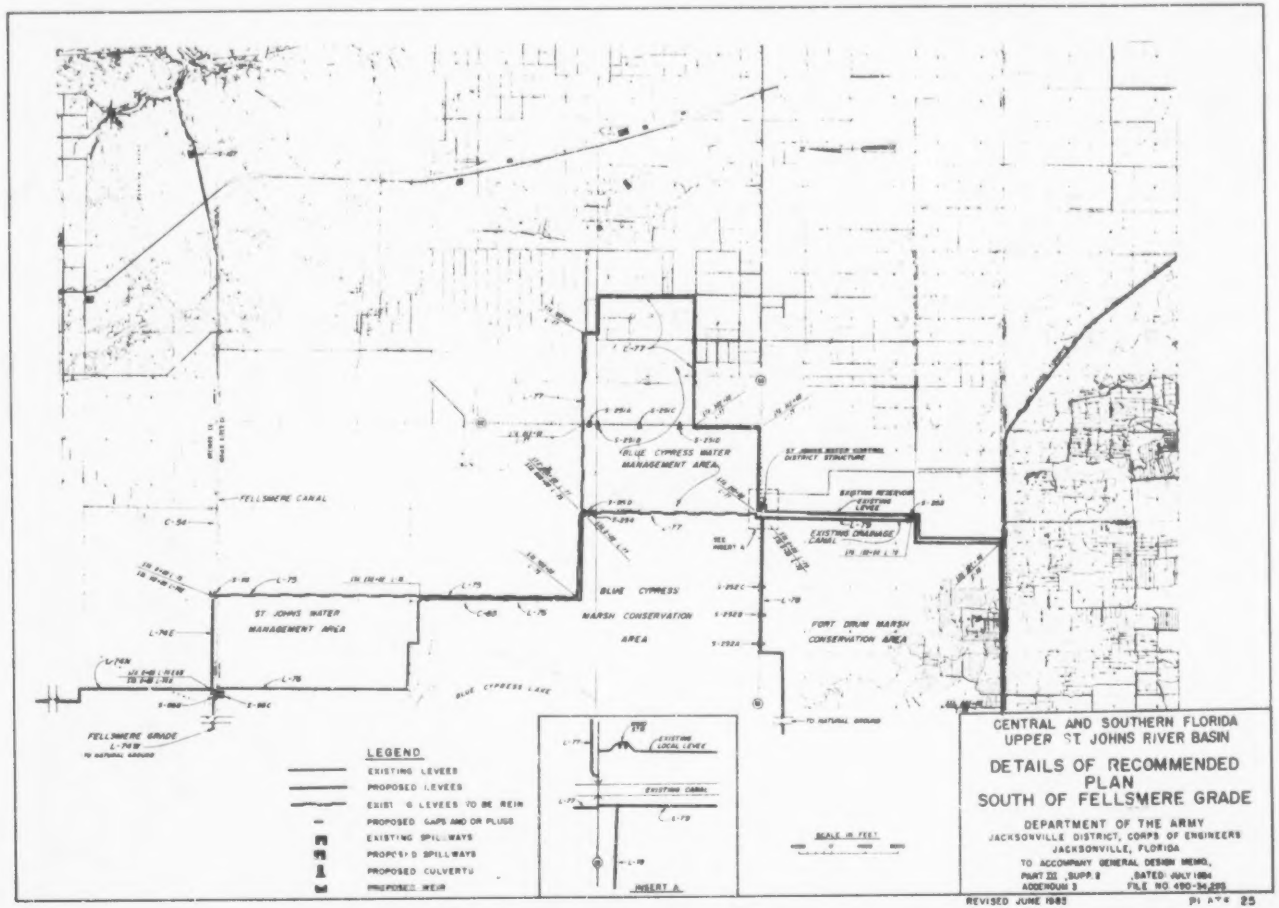
The St. Johns River Water Management District (SJRWMD) entered into an agreement with the Corps in 1976 to replan the project. The first step in the new process was to appoint a Technical Advisory Committee composed of regulated interests, environmental interests, and a representative from local, State, and Federal government. The first meeting of this committee was in May, 1980. The Committee attempted to formulate a plan or alternative which would accommodate flood control, water supply, and restoration of low flows caused by interbasin transfers of water, historical loss of nearly 300,000 floodplain acres to agricultural uses, and overdrainage in the basin. Low river and marsh water levels during the dry season cause water quality problems and reduce wildlife and recreational values both in the upper basin and the middle to lower (northern) portion of the river.

After several field trips and meetings, which exposed the Committee to the upper basin's problems and range of solutions, the Committee formulated a conceptual plan which was presented to the SJRWMD Board of Governors in September, 1980, accepted by the Board, and then passed on to the Corps for a review to assess the project for re-inclusion in the State's Public Works Program. The Corps released the revised General Design Memorandum and EIS for review in mid-1985. State review was very favorable. Initial work on the Jane Creek Flood Detention Area is projected for mid-1986. Therefore, FY 87 funding is requested by the SJRWMD for implementation of the project.

Project Justification

This project could begin reversing decades of environmental damage in the Upper St. Johns River Basin. The multi-faceted nature of the project is especially promising. Potentially, the project could offer flood control, water supply, restoration of minimum flows, and marsh recreation with associated water quality benefits.


CENTRAL AND SOUTHERN FLORIDA
UPPER ST JOHNS RIVER BASIN
DETAILS OF RECOMMENDED PLAN
NORTH OF FELLSMERE GRADE
DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
TO ACCOMPANY GENERAL DESIGN MEMO.
PART III, PAMP II
APPENDIX B
DATED JULY 1964
FILE NO 100-2-283
LEGEND
EXISTING LEVEES
PROPOSED LEVEES
EXISTING LEVEES TO BE REINFORCED
PROPOSED PLUG
EXISTING SPILLWAYS
PROPOSED SPILLWAYS
PROPOSED CULVERTS
PROPOSED WEIR
GAP
SCALE OF MILES
FELLSMERE CANAL
FELLSMERE GRADE
ST JOHNS WATER MANAGEMENT AREA



CENTRAL AND SOUTHERN FLORIDA
UPPER ST JOHNS RIVER BASIN

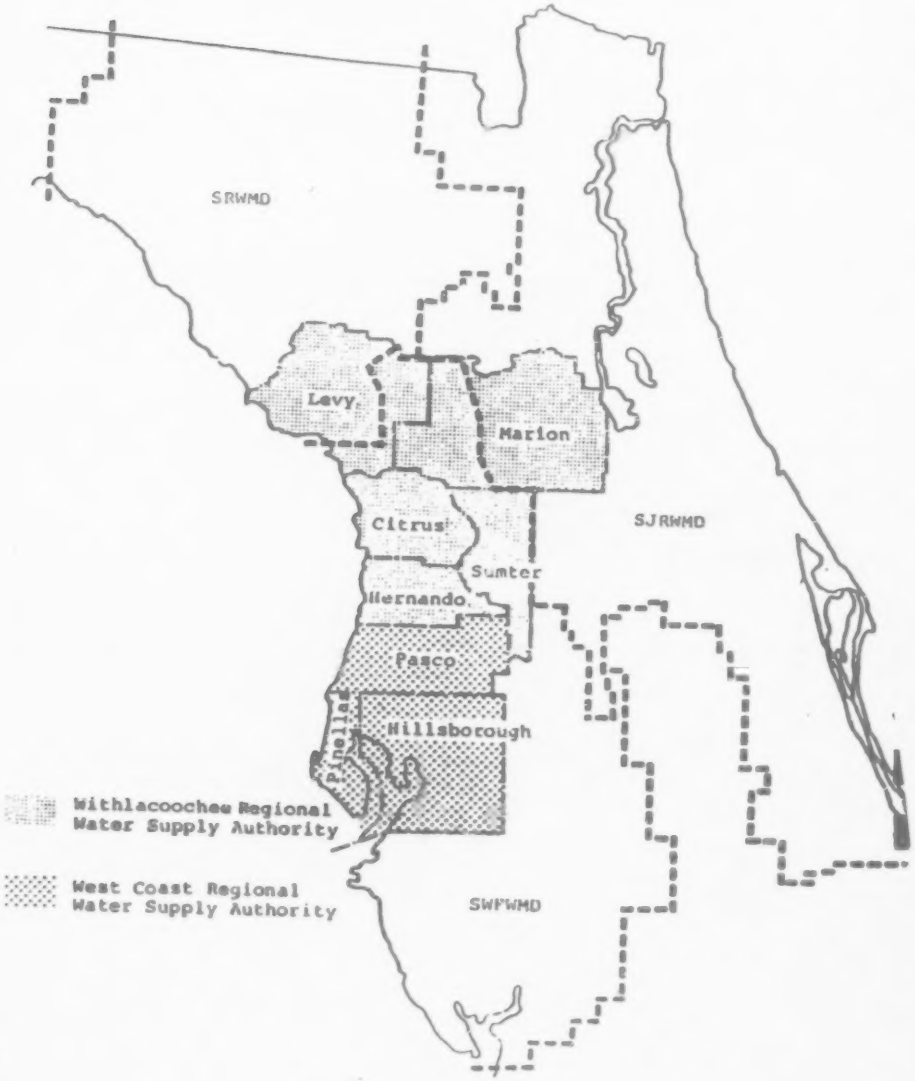
DETAILS OF RECOMMENDED PLAN SOUTH OF FELLSMERE GRADE

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

TO ACCOMPANY GENERAL DESIGN MEMO,
PART III , SUPP 2 , DATED: JULY 1984
ADDENDUM 3 FILE NO 490-34-295

REVISED JUNE 1985 PLATE 25

WITHLACOOCHEE REGIONAL WATER SUPPLY AUTHORITY



858

Withlacoochee River Regional Water Supply
(Phase II Study)

Estimated Federal Cost	$555,000
Estimated Non-Federal Cost	0
Federal Funds Through FY 86	350,000
Non-Federal Funds Through FY 86	0
President's Budget	0
State of Florida Request FY 87	200,000

Project History/Description

The Withlacoochee River Regional Water Supply Authority is proposing "Phase II" of the water supply study previously carried out by the Corps of Engineers. The Authority proposes that the initial survey of water supply problems and solutions be carried to a finer level of detail and design. They are not proposing that the Corps actually construct a complete water supply system.

Citrus and Hernando Counties, located within the study area, were the two fastest-growing counties in the State of Florida over the past decade. The Withlacoochee area was the only region of the State of Florida to exceed a 100% growth rate in the 1970's. This rapid growth, which is projected to continue, relates directly to the need to ensure a consistently high quality source of water in the Withlacoochee area.

Project Justification

This project is justified on the basis of bringing together the ongoing objectives of the Withlacoochee Regional Water Supply Authority and of the previously-completed Four River Basins Water Resources Management Study carried out by the Corps. Furthermore, although the previously funded three-year program successfully assembled a regional data base and made estimates of water needs and demands, an examination of the impacts and problems associated with the potential water supply alternatives for the area is still needed. This phase of the study will permit advanced planning, designing, and feasibility testing of water supply alternatives. Additionally, these plans will develop proposals for centralized water systems and determine the economic feasibility of each.

Navigation

11. Clearwater Spoil Disposal
12. Ft. Pierce Harbor
13. Jupiter Inlet
14. Lower St. Johns River Enhancement
15. Mexico Beach Inlet
16. Miami Harbor Channel
17. Miami River Study
18. Mill Cove
19. Port Canaveral Project
20. Port Canaveral Study
21. Port Everglades
22. Port Manatee
23. Port St. Petersburg
24. Tampa Harbor

NAVIGATION

Clearwater Spoil Disposal

Fort Pierce Harbor

Jupiter Inlet

Lower St. Johns River Enhancement

Mexico Beach Inlet

Miami Harbor Channel

Miami River Cleanup

Mill Cove (Jacksonville Harbor)

Port Canaveral Project

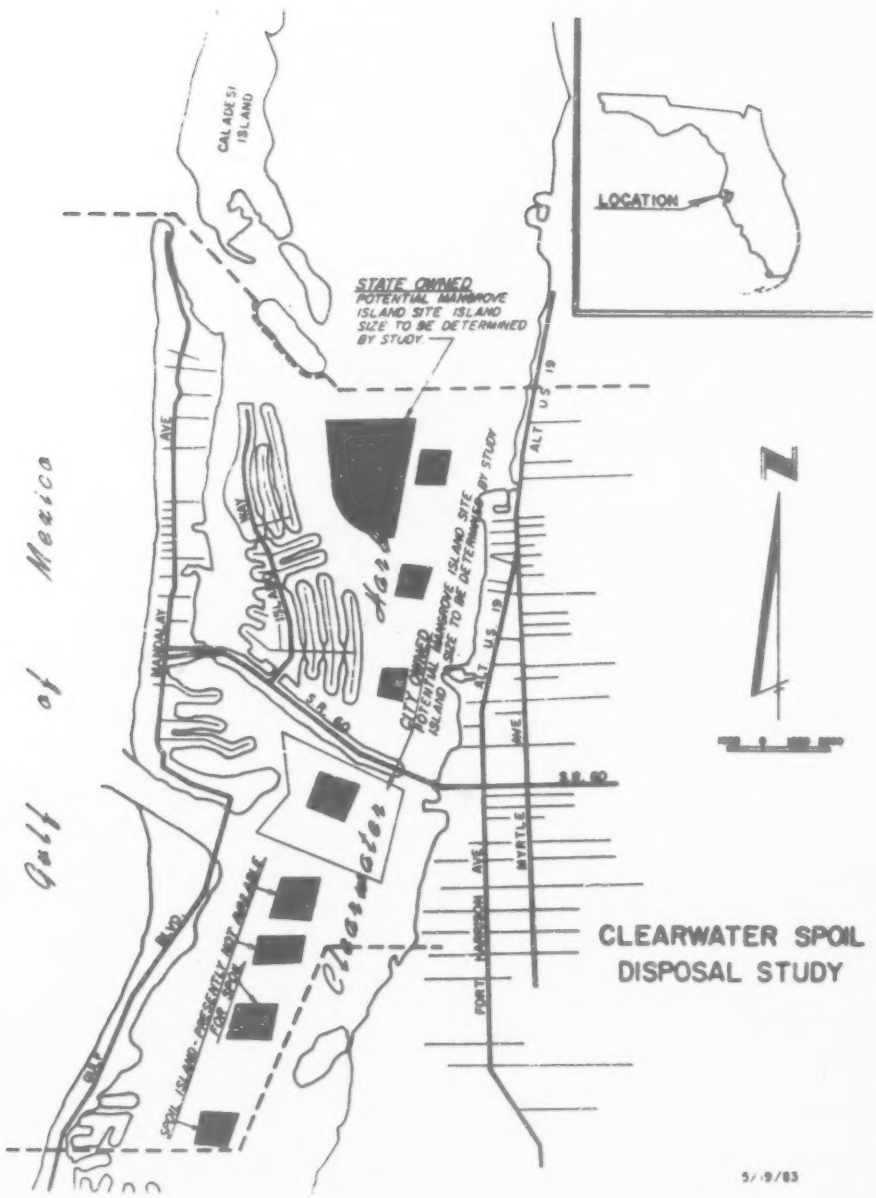
Port Canaveral

Port Everglades

Port Manatee Project

Port of St. Petersburg Basin/Channel Dredging Project

Tampa Harbor Deepening Project


LOCATION
STATE OWNED POTENTIAL MANGROVE ISLAND SITE ISLAND SIZE TO BE DETERMINED BY STUDY
CITY OWNED POTENTIAL MANGROVE ISLAND SITE SIZE TO BE DETERMINED BY STUDY
CLEARWATER SPOIL DISPOSAL STUDY
5/19/83
Gulf of Mexico
Clearwater
CALADESI ISLAND
ALT US 19
S.R. 60
MYRTLE AVE
FORT HARRISON AVE
HWY
N

Jupiter Inlet
(Study)

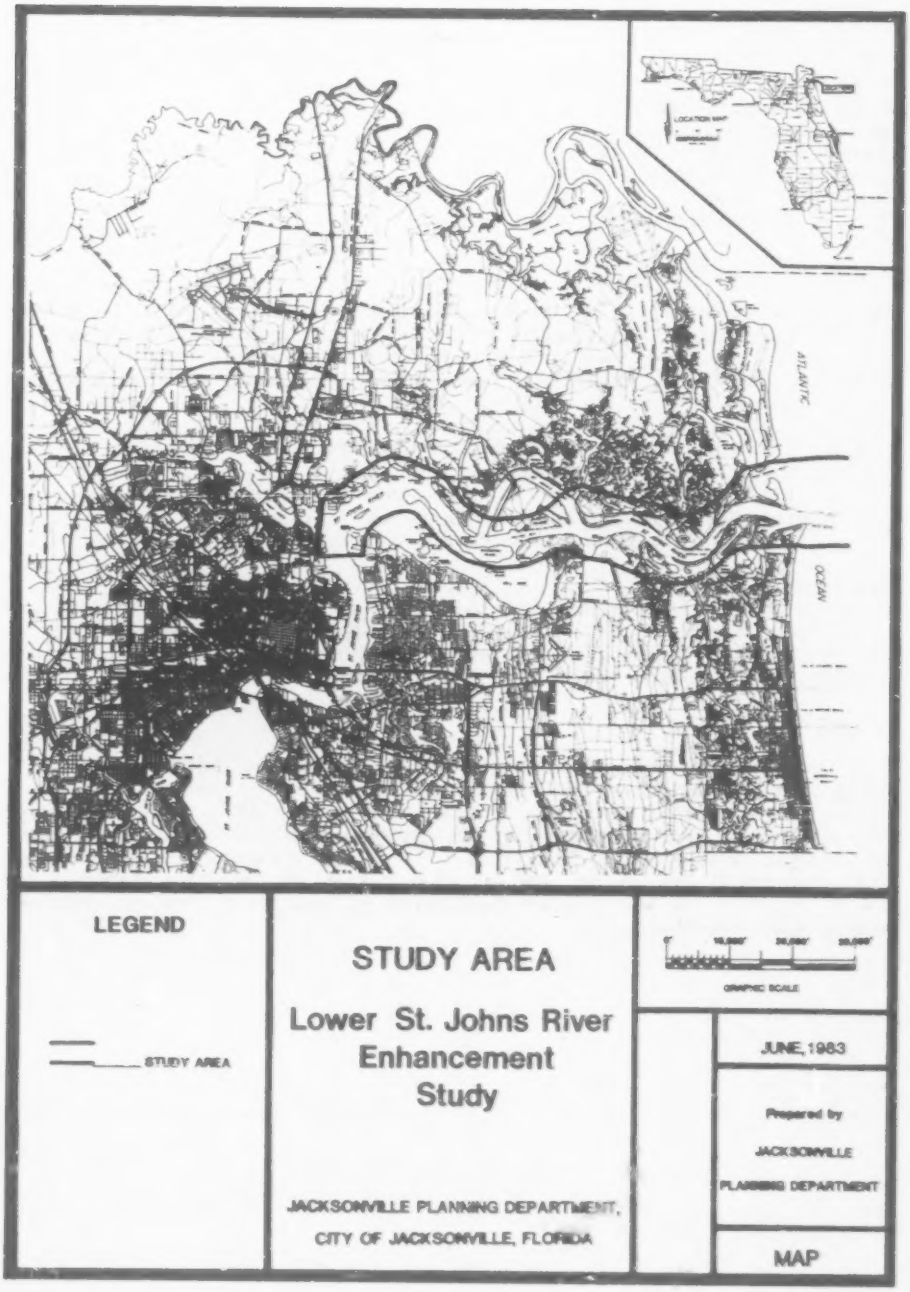
Estimated Federal Cost	$184,000
Estimated Non-Federal Cost	0
Federal Funds Through FY 86	50,000
Non-Federal Funds Through FY 86	0
President's Budget	0
State of Florida Request FY 87	100,000

Project History/Description

Jupiter Inlet is located in Northern Palm Beach County on the southeast coast of Florida, about 16 miles south of St. Lucie Inlet and 14 miles north of Lake Worth Inlet. It is a natural waterway connecting the Loxahatchee River with the Atlantic Ocean. Problems of sedimentation and erosion along both banks of the inlet have become a matter of concern in recent years. Jupiter Inlet is also affected by navigational difficulties due to hazardous waves and inadequate depths across the ocean bar at its entrance. Its use is currently limited to boaters with knowledge of local conditions. In the past twenty years approximately ten people have been killed in boating accidents at the inlet.

Project Justification

Jupiter Inlet is important because of its aesthetic and recreational values, its value as a prime residential development and because it is the primary waterway connecting the Loxahatchee River to the Atlantic Ocean. The study would determine if major improvements to the Inlet are economically justifiable. The project would directly benefit the pleasure boaters and commercial fishermen in the area by decreasing the danger associated with the inlet. It would also bring an increase in business to the marine oriented business of the area, and increase tourism.


ATLANTIC
OCEAN
LOCATION MAP
LEGEND
STUDY AREA
STUDY AREA
Lower St. Johns River
Enhancement
Study
JACKSONVILLE PLANNING DEPARTMENT,
CITY OF JACKSONVILLE, FLORIDA
GRAPHIC SCALE
JUNE, 1983
Prepared by
JACKSONVILLE
PLANNING DEPARTMENT
MAP

Lower St. Johns River Enhancement
(Study)

Estimated Federal Cost	$490,000
Estimated Non-Federal Cost	350,000
Federal Funds Through FY 86	0
Non-Federal Funds Through FY 86	0
President's Budget	0
State of Florida Request FY 87	200,000

Project History/Description

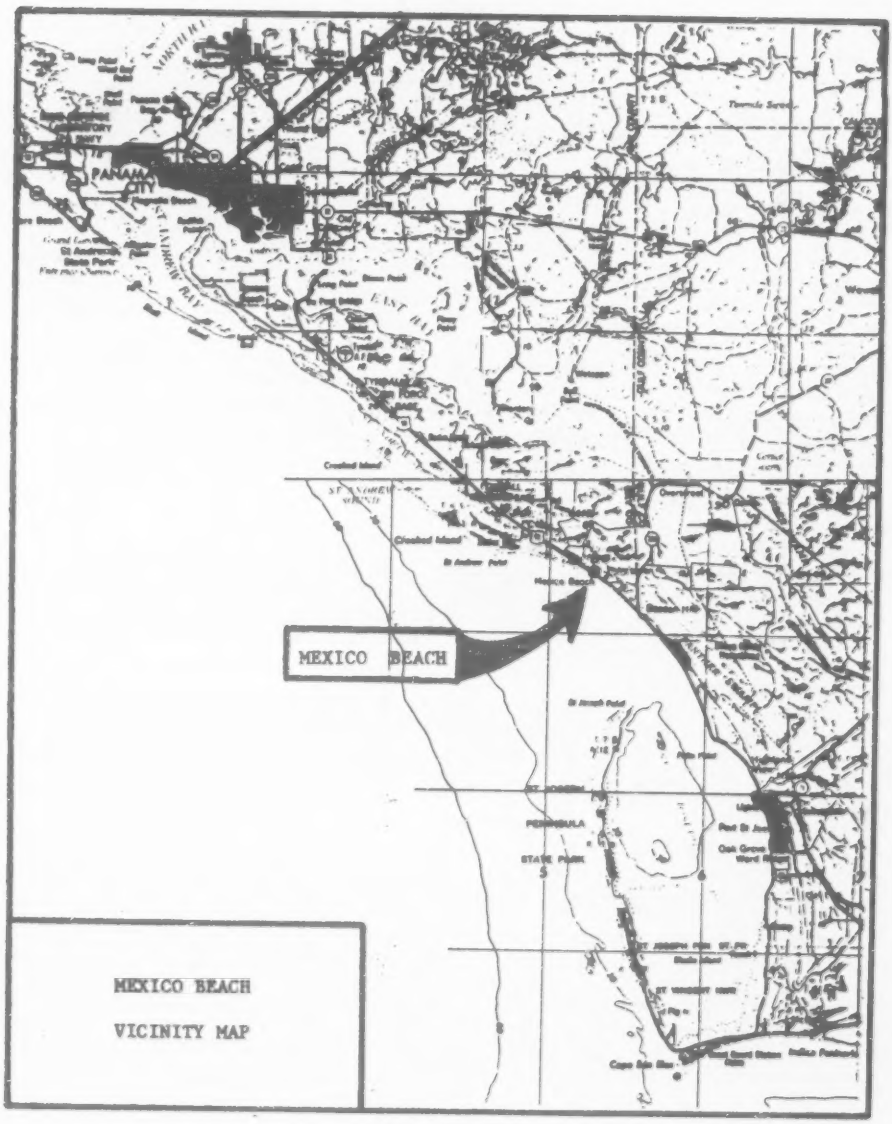
The City of Jacksonville has requested funding for this study to assess the Jacksonville Harbor Channel in the St. Johns River from the Atlantic Ocean to the vicinity of the Port of Jacksonville for possible improvements to navigation, shoreline erosion, and recreation. The study would address the following problems:

1. Navigational hazards and channel blockages;
2. Shoreline erosion and flood protection;
3. Production of potential disease-vectoring mosquitoes from water pools at dredged material disposal sites, as well as other impacts; and
4. Inadequate recreational access.

This is a general study designed to identify the problems caused by years of neglect and to determine methods to restore and enhance the shoreline and environment in general. The study will include specific recommendations for removing hazards, reducing the impact of spoil sites, and combating mosquito breeding. FY 87 funding would be used to initiate the study.

Project Justification

This study is expected to result in recommendations to decrease erosion by stabilizing the shoreline and dune areas, increase flood protection, improve navigation and navigational aids, reduce the impact of spoil sites, reduce non-point sources of contamination, restore destroyed salt water marsh areas, and improve recreational facilities. Proposed channel and navigational improvements will benefit port and maritime interests. Shoreline stabilization and flood protection will enhance development of waterfront lands and increase recreational benefits.



MEXICO BEACH VICINITY MAP

Mexico Beach Inlet
(Continued Planning and Engineering)

Estimated Federal Cost	To Be Determined
Estimated Non-Federal Cost	To Be Determined
Federal Funds Through FY 86	0
Non-Federal Funds Through FY 86	0
President's Budget	0
State of Florida Request FY 87	$200,000

Project History/Description

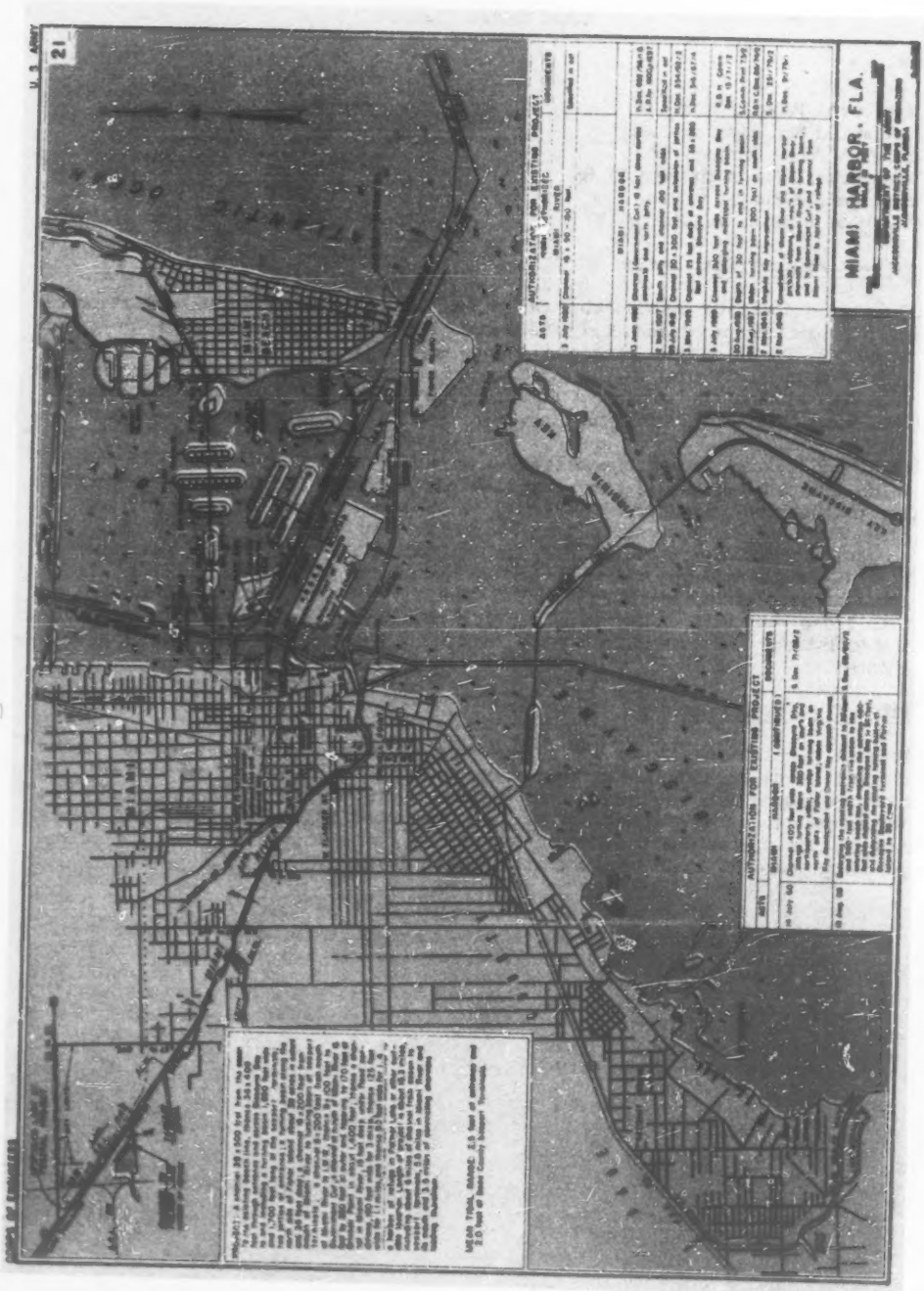
Mexico Beach is located on the coast of Bay County approximately 20 miles southeast of Panama City. The canal in question is not associated with a natural inlet and is approximately 50 feet wide, 4,000 feet long, and 8 feet deep. The canal provides access to the open waters of the Gulf of Mexico for boats launched at the three marinas located along the sheltered stretches of the canal. A boulder jetty extends 50 feet seaward from the western edge of the canal.

The Corps of Engineers' Draft Reconnaissance Report for the study was released in early 1983 and indicated that several project alternatives were economically feasible and environmentally acceptable. The Corps District Engineer concluded that the project is needed, it is of Federal interest, and that it would provide substantial economic benefits. All alternatives would provide a 6-foot-deep inner channel and an 8-foot deep outer channel. Thus, FY 87 funding would be needed to initiate continued planning and engineering.

Project Justification

The economy of the Mexico Beach area is tourist-dependent, and tourists come to Mexico Beach for basically two activities: fishing (mostly from boats) in the Gulf of Mexico, and beach-related recreation. Fishermen (and other boaters) using the three marinas located along the canal in question generate a significant portion of Mexico Beach's revenues. Local efforts to keep the canal inlet open have been only partially successful. Thus, the economic impacts of canal closing have been substantial, and maintenance of a navigable channel would be a significant boost to the local economy.

A channel mitigation project at Mexico Beach could have other important benefits. Redesign of the jetty at the mouth of the canal could reduce or eliminate the jetty's contributions to erosion of adjacent beaches. In addition, suitable spoil material from the canal could be used to renourish these beaches. Finally, safe refuge could be provided for boats during storm conditions. Currently, no safe harbor exists between Port St. Joe and Panama City, a distance of approximately thirty miles.


MIAMI HARBOR, FLA.
AUTHORIZATION FOR EXISTING PROJECT
AUTHORIZATION FOR EXISTING PROJECT
MEAN TIDAL RANGE, 2.5 feet at entrance and 2.0 feet at Dade County Airport Terminal
U. S. ARMY
21

Miami Harbor Channel
(CP&E)

Estimated Federal Cost	$740,000*
Estimated Non-Federal Cost	0
Federal Funds Through FY 86	740,000*
Non-Federal Funds Through FY 86	0
President's Budget	0
State of Florida Request FY 87	250,000

Project History/Description

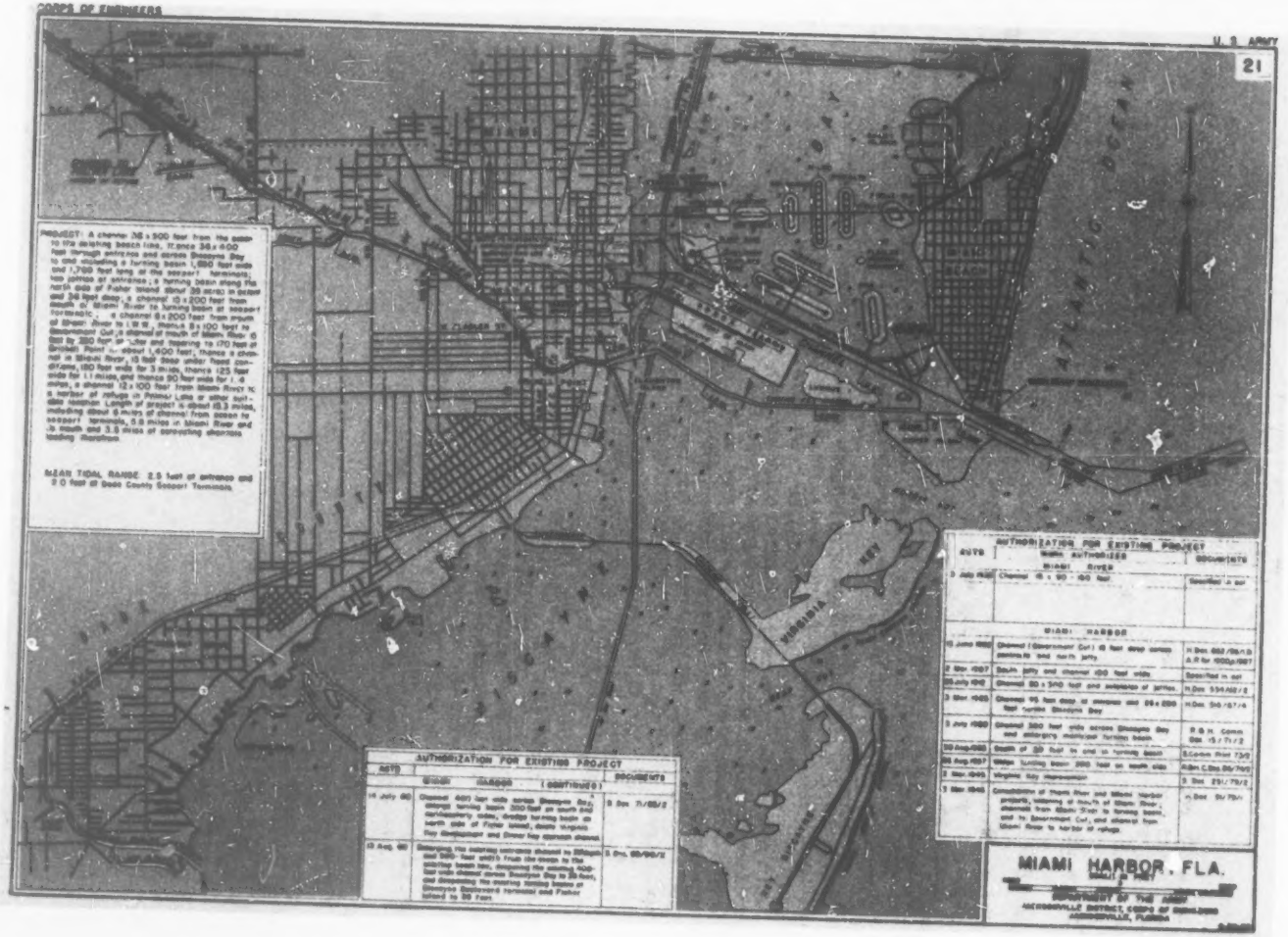
This would initiate construction of channel improvements after an evaluation of the navigation problems associated with the present configuration of Miami Harbor. The specific problems being addressed are the possible hazards presented by a 60° turn in the offshore access channel, the constriction of the main ship channel in Government Cut from 500 feet to 400 feet, and the existing 1600-foot diameter turning basin.

The bend in the access channel may present a safety and navigation problem which could be increasing as large ships use Miami Harbor more frequently. Due to the bend, the channel can only be used for one-way traffic, and several groundings of large vessels have occurred over the past few years. The constriction of the ship channel inside Government Cut causes a navigational hazard compounded by strong tides and currents. The main turning basin presents problems to ships over 1,000 feet long in positioning and in dealing with tides, currents and winds while turning. There is also a desire to modify the existing Government Cut jetty system to reduce rip tides in the main channel.

Project Justification

Project benefits could include a reduction in delays in navigating the access channel, a reduction of the need for tug services in the access channel and turning basin, and an increase in the safety of the harbor, particularly for larger ships. The project is strongly supported by the Biscayne Bay Pilots Association. Possible coral reef destruction, depending on the results of the planning process, could become a serious problem.

* Study


CORPS OF ENGINEERS
U. S. ARMY
21
PROJECT: A channel 36 x 500 feet from the ocean to the existing beach line, 17 once 36 x 400 feet through entrance and across Biscayne Bay to and including a turning basin 1,850 feet wide and 1,700 feet long at the seaport terminals, two jetties at entrance; a turning basin along the north side of Fisher Island about 39 acres in extent and 34 feet deep; a channel 12 x 200 feet from south of Miami River to turning basin at seaport terminals; a channel 8 x 200 feet from mouth of Miami River to 1 N E., thence 8 x 100 feet to Government Cut; a channel of mouth of Miami River 6 feet by 200 feet at Lummus and tapering to 170 feet at Brickell Point a distance of about 1,400 feet, thence a channel in Miami River, 15 feet deep under fixed conditions, 150 feet wide for 3 miles, thence 125 feet wide for 1.1 miles, and thence 90 feet wide for 1.4 miles, a channel 12 x 100 feet from Miami River to a harbor of refuge in Pumpkin Lake or other suitable location. Length of project is about 15.3 miles, including about 6 miles of channel from ocean to seaport terminals, 5.8 miles in Miami River and its mouth and 3.5 miles of approaching channels leading thereto.
MEAN TIDAL RANGE: 2.5 feet at entrance and 2.0 feet at Dade County Seaport Terminals.
AUTHORIZATION FOR EXISTING PROJECT
DATE | MIAMI HARBOR (CONTINUED) | DOCUMENTS
14 July 1930 | Channel 400 feet wide across Biscayne Bay, Dodge turning basin 300 feet at south end and tributary notes, Dodge turning basin at north side of Fisher Island, Dodds Virginia Key Embayment and Dinner Key approach channel | H. Doc. 71/69/2
13 Aug. 1937 | Deepening the existing entrance channel to Miami Inlet 500 feet width from the ocean to the existing beach line, deepening the existing 400-foot wide channel across Biscayne Bay to 36 feet, and deepening the existing turning basins at Biscayne Boulevard terminal and Fisher Island to 36 feet | H. Doc. 69/90/2
AUTHORIZATION FOR EXISTING PROJECT
DATE | MIAMI RIVER | DOCUMENTS
3 July 1930 | Channel 15 x 90 - 150 feet | Described in act
MIAMI HARBOR
13 June 1902 | Channel (Government Cut) 18 feet deep across peninsula and north jetty | H. Doc. 602/58th C. & R for 1900/1907
2 Mar. 1907 | South jetty and channel 400 feet wide | Described in act
25 July 1912 | Channel 30 x 300 feet and extension of jetties | H. Doc. 559/62/2
3 Mar. 1905 | Channel 25 feet deep at entrance and 24 x 200 feet turning Biscayne Bay | H. Doc. 345/57/2
3 July 1930 | Channel 300 feet wide across Biscayne Bay and emergency municipal turning basin | S. & H. Comm Doc. 15/71/2
20 Aug. 1937 | South of 20 foot to and to turning basin | S. Comm Print 73/2
26 Aug. 1937 | Widen turning basin 200 feet on south side | Adm. C. Doc. 86/76/2
2 Mar. 1945 | Virginia Key improvements | S. Doc. 251/78/2
3 Mar. 1945 | Consolidation of Miami River and Miami Harbor projects, widening at mouth of Miami River, channel from Miami Inlet to turning basin, and to Government Cut, and channel from Miami River to harbor of refuge | H. Doc. 94/78/2
MIAMI HARBOR, FLA.
SHEET 2 OF 2 SHEETS
DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

870

Miami River Cleanup
(Implementation)

Estimated Federal Cost	$183,000
Estimated Non-Federal Cost	0
Federal Funds Through FY 86	183,000
Non-Federal Funds Through FY 86	0
President's Budget	0
State of Florida Request FY 87	183,000

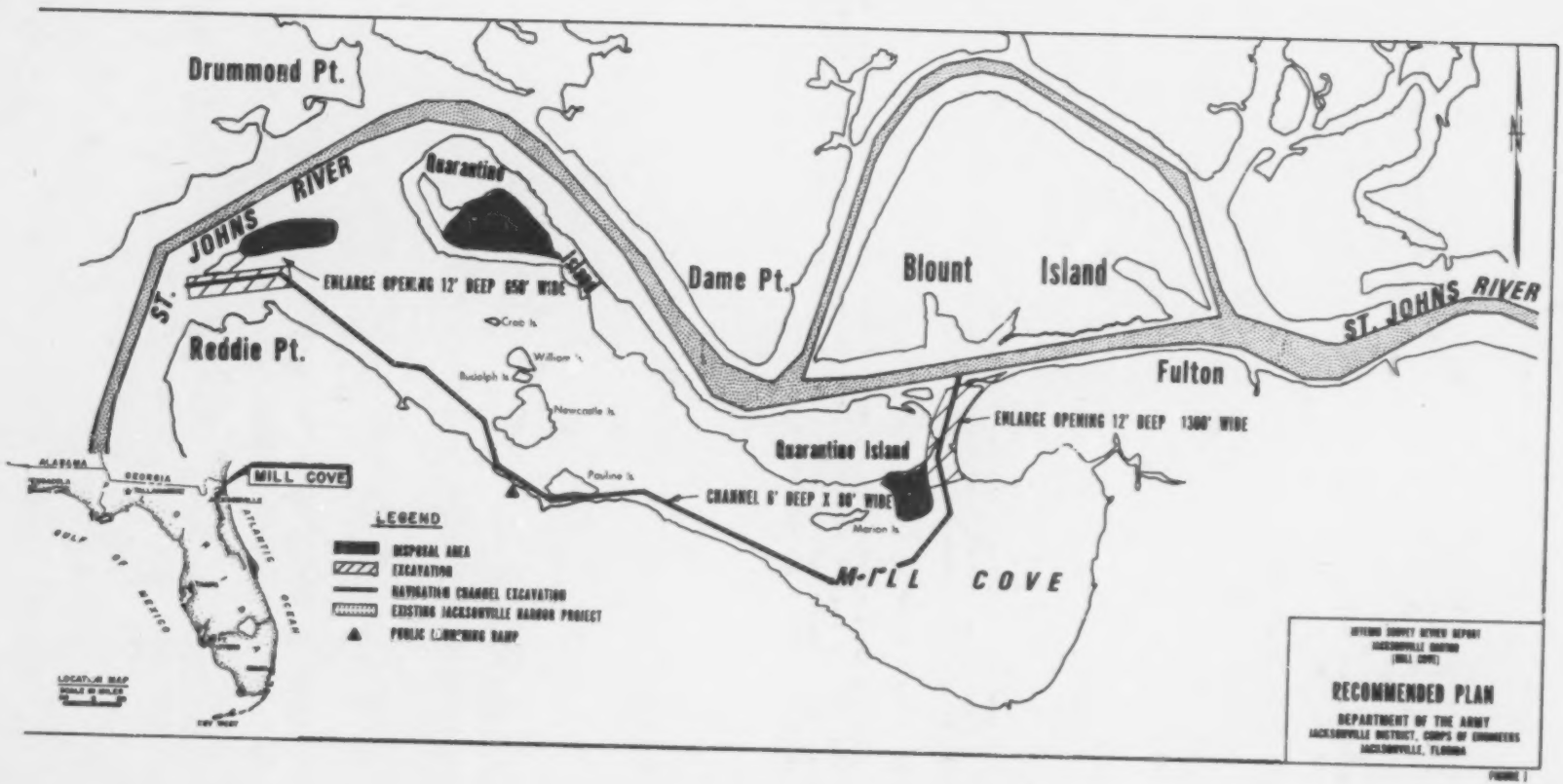
Project History/Description

This proposal by Dade County is for funding to undertake construction of the proposed project. The study area is the six miles of the Miami River in Dade County from its mouth to a point past 36th Street where it joins the Miami Canal, as well as the 14 miles of the canal within Dade County. The study, not yet completed at this time, is investigating the feasibility of dredging the Miami River to improve water quality and navigability.

The river is a Federal navigation project with authorized channel depths of fifteen feet. Development over many years has caused serious water quality problems in the river and it may be advisable to remove the contaminated sediments in the channel. Studies already completed by DER and the Corps confirm that the sediments are heavily polluted. However, in the 1970's, the Corps suspended the completion of the study, pending action by the local sponsor to reduce the continuing pollutant loading to the river. Dade County has made progress in this area. Another related event is the Governor's appointment of a Miami River Management Committee to devise means of improving all assets of this urban waterway. Water quality and navigation improvements are included in the objectives of the committee. They have recommended removal of the sediments.

Project Justification

The Miami River is an underused urban resource. The Miami River Management Committee and Dade County are striving to improve its value for navigation, recreation, tourism and as an aesthetic amenity. The polluted sediments in the navigation channel are degrading water quality and preventing full use of a major urban river.


Drummond Pt.
ST. JOHNS RIVER
Quarantine Island
ENLARGE OPENING 12' DEEP 650' WIDE
Reddie Pt.
Dame Pt.
Blount Island
ST. JOHNS RIVER
Fulton
ENLARGE OPENING 12' DEEP 1300' WIDE
Quarantine Island
CHANNEL 8' DEEP X 80' WIDE
MILL COVE
Crab Is.
Willow Is.
Rudolph Is.
Newcastle Is.
Pauline Is.
Marion Is.
ALABAMA
GEORGIA
FLORIDA
GULF OF MEXICO
ATLANTIC OCEAN
LOCATION MAP
LEGEND
DISPOSAL AREA
EXCAVATION
NAVIGATION CHANNEL EXCAVATION
EXISTING JACKSONVILLE HARBOR PROJECT
PUBLIC BOATING RAMP
N
RECOMMENDED PLAN
DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

Mill Cove (Jacksonville Harbor)
(Construction)

Estimated Federal Cost	$4,000,000 +	($125,000 for CP&E)
Estimated Non-Federal Cost	0	
Federal Funds Through FY 86	0	($125,000 for CP&E)
Non-Federal Funds Through FY 86	0	
President's Budget	2,000,000	
State of Florida Request FY 87	2,000,000	
Benefit Cost Ratio: 1.8 to 1		

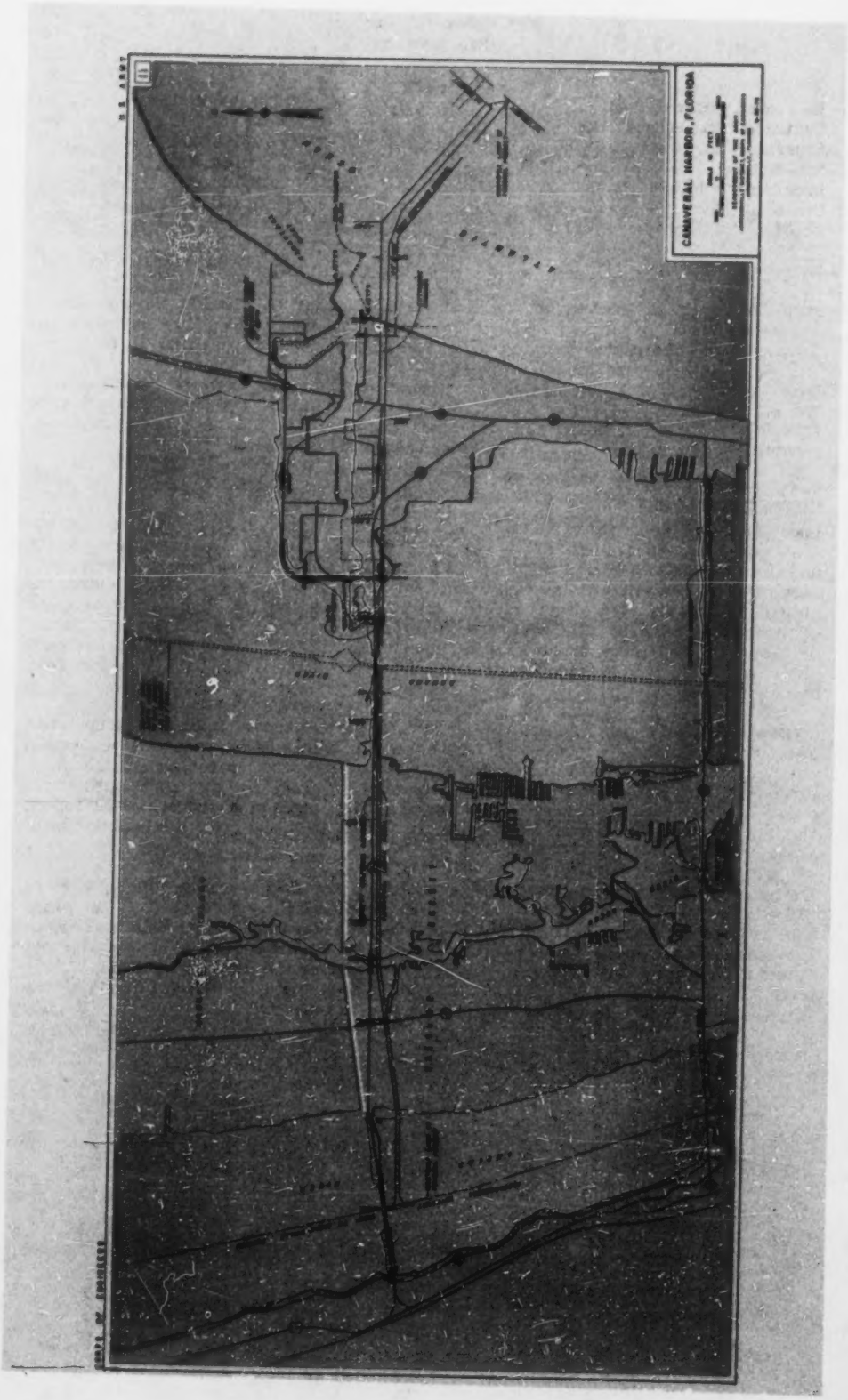
Project History/Description

The Jacksonville Port Authority has requested funding for the Mill Cove Project. Mill Cove is on the St. Johns River in the City of Jacksonville. It is located approximately 12 miles from the Atlantic Ocean and covers an area of 6 square miles with an average depth of 3.5 feet.

Much of Mill Cove was formerly part of the St. Johns River with its depth averaging 6 to 7 feet. During the early 1950's, the Dame Point-Fulton Cutoff was constructed in the interest of improving navigability in the St. Johns River as a part of the Jacksonville Harbor Project. This construction, combined with the completion of the 38-foot harbor deepening project in 1976, reduced the flow of water through Mill Cove and increased sedimentation. This has resulted in small boat navigation problems, recreational limitations, and alleged loss of waterfront land values. The Corps proposal would both modify the hydraulic flow through Mill Cove.

Project Justification

Sedimentation has reduced depths in most of Mill Cove; it eventually may become too shallow to support commercial and recreational activities. Increased circulation of water flow would restore and maintain depths and improve water quality and habitat areas within the cove.


CANAVERAL HARBOR, FLORIDA

Port Canaveral Project
(Construction)

Estimated Federal Cost	$26,300,000
Estimated Non-Federal Cost	4,354,000
Federal Funds Through FY 86	12,163,000
Non-Federal Funds Through FY 86	164,000
President's Budget	3,100,000
State of Florida Request FY 87	3,100,000
Benefit Cost Ratio: 2.6:1.0	

Project History/Description

Port Canaveral is located on the east central coast of Florida, approximately 150 miles south of Jacksonville. The Canaveral Port Authority is requesting funding to complete the dredging of a channel and turning basin to 31 feet.

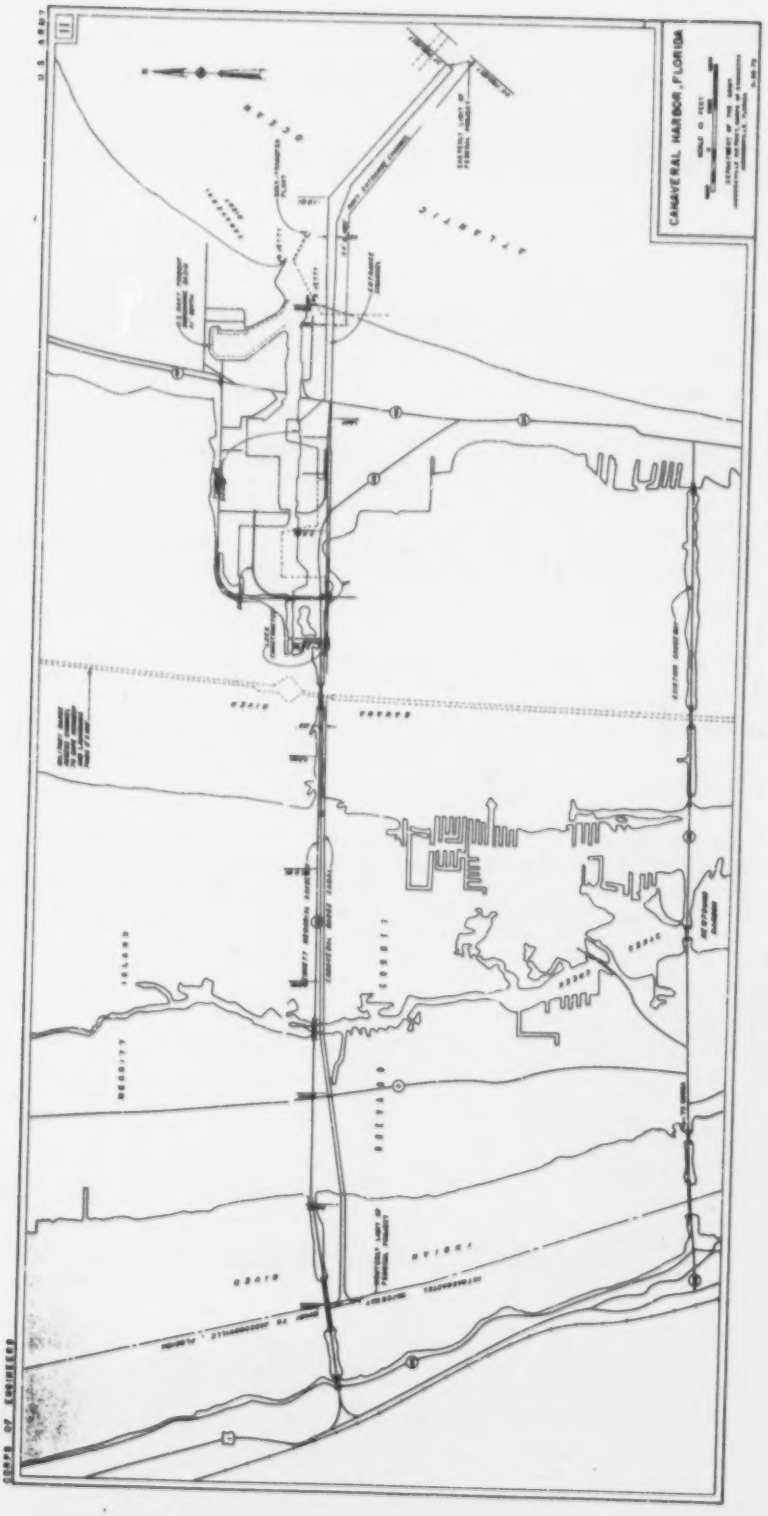
Approximately $8.0 million would be needed in FY 86 to complete construction. The port authority will pay approximately $6 million of the total project cost ($14.8 million). A draft EIS and final supplemental EIS have been prepared. Permits have been acquired for a dredged depth of 31 feet.

Project Justification

Port Canaveral has become an important energy port providing facilities for low cost ocean transportation of bunker fuel for the area's electric power plants and for the import and export of bulk commodities such as cement, newsprint, slag, citrus concentrate, frozen fish, and scrap metal. The port's business is growing along with the unprecedented growth of the Central Florida region. As of now, all piers at the port are fully used or committed to projects under development, and there is no room for expansion for deep draft ship operations. The requested construction is needed as soon as possible to allow for this needed expansion.

Completion of the western turning basin is particularly important. Unstable sediment conditions are making harbor depth maintenance more difficult and costly. Project completion would significantly reduce maintenance dredging, since bulkheading (which would be completely funded by the port authority) could be completed and depth would be generally equalized. This would reduce the environmental impacts on the harbor area and the need for large spoil areas.

The environmental mitigation plan proposed by the Corps in the original draft EIS was much-improved in the April, 1985 supplement to the draft. Two plans are favored by the U.S. Fish and Wildlife Service, the Corps, and most other interests. Both would substantially improve wetland conditions in the adjacent Sykes Creek area, now managed primarily for mosquito control. Plan "A" is superior environmentally to Plan "B", but would require acquisition (by the Corps or some other party) of several hundred acres.


CANAVERAL HARBOR, FLORIDA
ATLANTIC
OCEAN
ISLAND
CORPS OF ENGINEERS

Port Canaveral
(Reconnaissance Study)

Estimated Federal Cost	$50,000
Estimated Non-Federal Cost	0
Federal Funds Through FY 86	0
Non-Federal Funds Through FY 86	0
President's Budget	0
State of Florida Request FY 87	50,000

Project History/Description

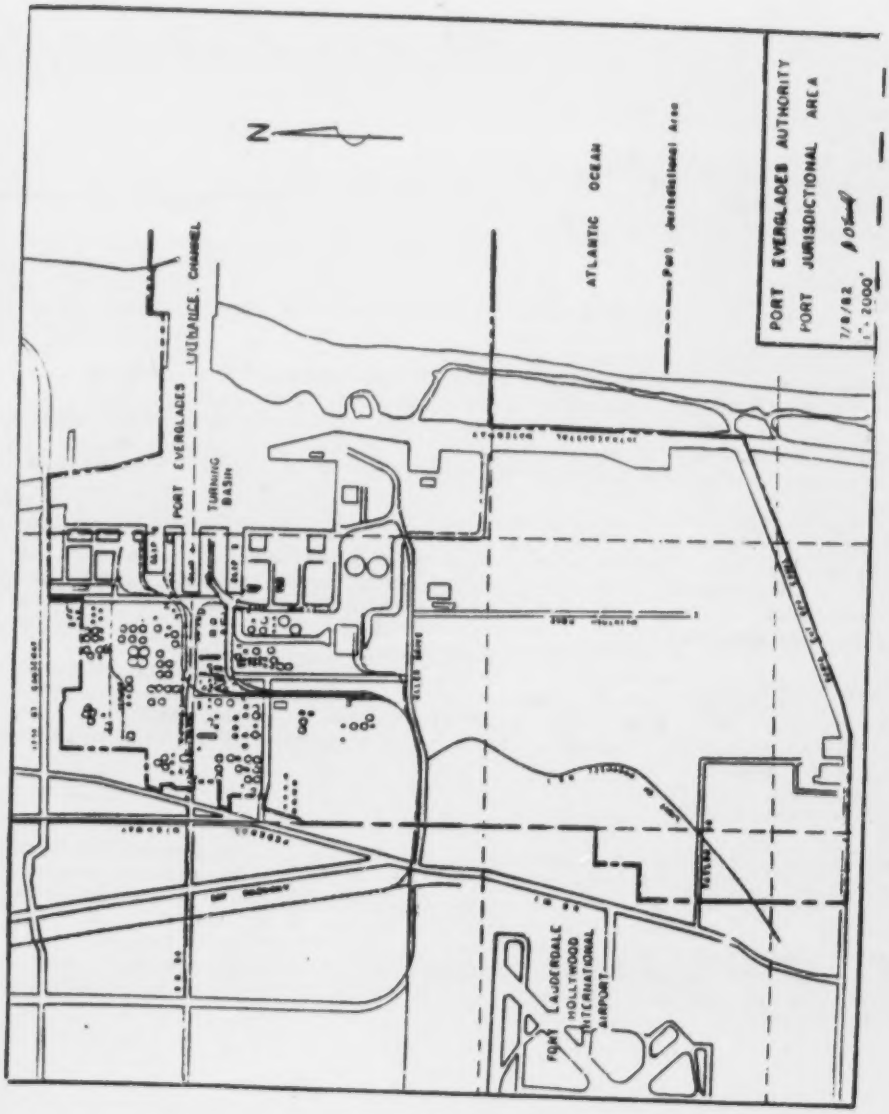
The Canaveral Port Authority is requesting a feasibility study of dredging the Canaveral Harbor Channel and other areas of Port Canaveral to sufficient depths to allow for economical importation of coal and other commodities. The study would also evaluate a possible expansion of Federal maintenance dredging at the port.

Port Canaveral is located on the east central coast of Florida approximately 150 miles south of Jacksonville. This proposed study springs from a lease agreement executed in 1980 between a shipping company and the port authority. The shipping company is planning to locate a coal offloading, storage, and transportation facility at Port Canaveral. The deep draft nature of the coal carrying vessels would require a channel depth of at least 41 feet.

Project Justification

A coal offloading, storage, and transporting facility at Port Canaveral could be used to provide coal economically for power plants in central and eastern Florida. The coal would replace petroleum, and this substitution is consistent with Federal policy aimed toward restricting petroleum imports. The most economical coal carrying vessels require a channel depth of 41-45 feet, and Port Canaveral currently is not deep enough to accommodate such vessels fully loaded.

Maintenance dredging of the various channels and turning basins at Port Canaveral is currently done by the port authority, the Corps of Engineers, and the Navy. This multiple maintenance situation is confusing, cumbersome, and inefficient. Many contracting conflicts have made dredging more expensive and time consuming than it would have been if done under a single contract. Federal assumption of this maintenance dredging would alleviate these problems.


N
ATLANTIC OCEAN
Port Jurisdictional Area
PORT EVERGLADES AUTHORITY
PORT JURISDICTIONAL AREA
PORT EVERGLADES ENTRANCE CHANNEL
TURNING BASIN
FORT LAUDERDALE HOLLYWOOD INTERNATIONAL AIRPORT

Port Everglades
(Study)

Estimated Federal Cost	$140,000
Estimated Non-Federal Cost	95,000
Federal Funds Through FY 86	43,000
Non-Federal Funds Through FY 86	0
President's Budget	50,000
State of Florida Request FY 87	50,000

Project History/Description

This is a proposed study of the desirability of modifying the existing federal navigation project at Port Everglades.

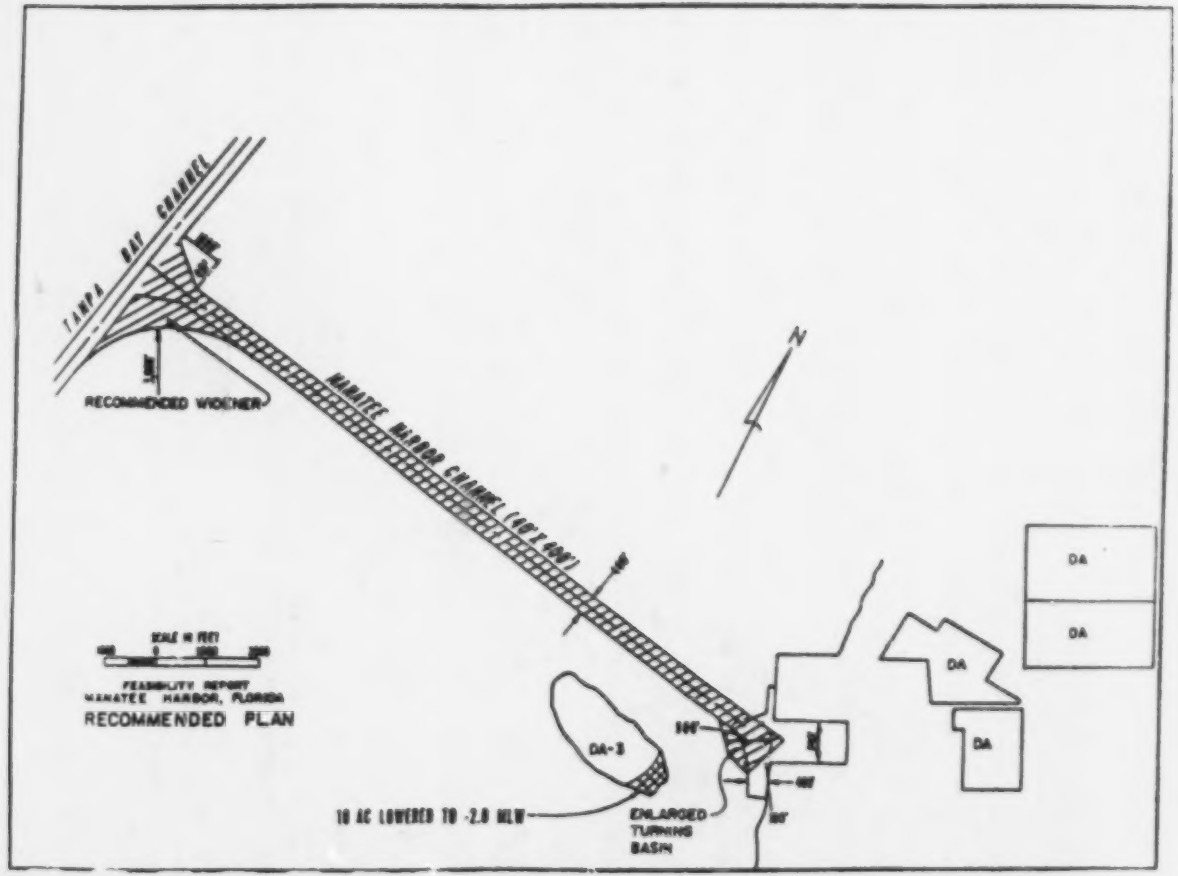
Port Everglades is managed by the Port Everglades Authority, a special district in Ft. Lauderdale and Hollywood, Florida. The Port serves several import and export markets. The Port is the fourth-largest cruise ship port in the world, includes an active Foreign Trade Zone, a major containerization trade, significant general cargo business, and serves as a very large petroleum importer.

The Port Everglades Master Plan projects expansion of cargo and especially of container business. Growth in container tonnage will require improvement of landside and channel facilities. This study would generate alternative modifications to the existing federal navigation project and identify engineering, economic, and environmental details.

The study has been authorized by Congress. The FY 87 proposal is for a $95,000 appropriation for completion of an Army Corps of Engineers Reconnaissance Study previously requested for FY86. If the results of that preliminary study are favorable, the study can be carried on to a complete Feasibility Report.

Project Justification

The enhancement of Port Everglades would benefit its market hinterland, which is most of South Florida. The 1983 Master Plan estimates the regional economic impact of Port Everglades activities to total $412 million. It also projects that Year 2000 economic impacts will be between $1.45 and $2.25 billion, depending partly on whether a substantial part of the port's petroleum business is diverted by a new petroleum products pipeline. In either case, improvements of Port Everglades can substantially contribute to the well-being of the regional economy.


TAMPA BAY CHANNEL
RECOMMENDED WIDENER
MANATEE HARBOR CHANNEL (36' X 400')
N
SCALE IN FEET
FEASIBILITY REPORT
MANATEE HARBOR, FLORIDA
RECOMMENDED PLAN
DA-3
10 AC LOWERED TO -2.0 MLW
ENLARGED TURNING BASIN
DA
DA
DA
DA
100'
400'
600'

Port Manatee Project
(Construction)

Estimated Federal Cost	$12,710,000
Estimated Non-Federal Cost	3,727,000
Federal Funds Through FY 86	0
Non-Federal Funds Through FY 86	0
President's Budget	0
State of Florida Request FY 87	12,710,000
Benefit Cost Ratio: 6.9 to 1	

Project History/Description

The Port Manatee Project is a proposal for Federal assumption of maintenance dredging of the existing navigation channel constructed by the Manatee County Port Authority in 1969-71. The proposed plan involves both removal of materials deposited in the channel since its construction and new construction at both ends of the channel to improve the safety of navigation. The channel dimensions would be 400 feet wide by 40 feet deep at mean low water (the same as originally constructed by the Port Authority) plus two feet allowable overdredging. Total channel length would be 2.65 miles, extending from the port facilities to the main Tampa Harbor Channel.

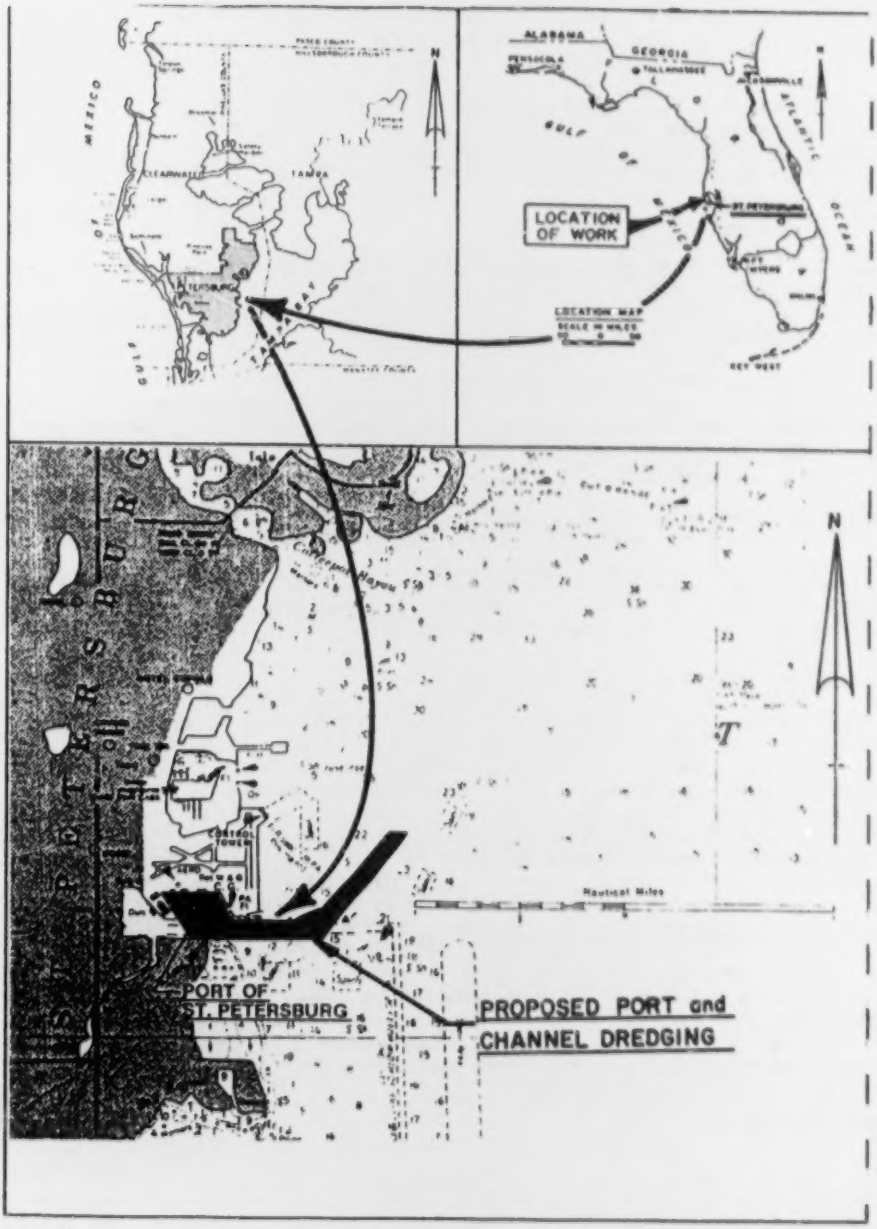
The project includes an attempt to mitigate for the environmental damage done by the dredging. Ten acres of an existing above-water spoil island would be lowered to -2 feet mean low water to compensate for the destruction of 6.6 acres of vegetated shallow bay bottom caused by the enlargement of the turning basin. Vegetation planting is not planned, but the Corps of Engineers believes that the lowered area will revegetate itself naturally.

Project authorization is necessary.

Project Justification

The Port of Manatee now serves the local area both for oil imports and for phosphate exports. The Feasibility Report and the Environmental Impact Statement (EIS) for the proposed project were published in 1979 and assumption of the project was recommended. The selected "Environmental Quality" plan of spoil disposal includes 100% upland disposal.

The Port Manatee project would destroy additional seagrasses in the bay. Although the plan does call for natural revegation of an equal area of seagrasses, the current mitigation plan does not seem adequate. Special care must be taken to assure successful revegetation and adequate mitigation.


ALABAMA
GEORGIA
PENSACOLA
TALLAHASSEE
JACKSONVILLE
GULF OF MEXICO
ATLANTIC OCEAN
LOCATION OF WORK
ST. PETERSBURG
KEY WEST
LOCATION MAP
SCALE IN MILES
MEXICO
GULF OF
CLEARWATER
TAMPA
N
Tampa Bay
Channel
Nautical Miles
PORT OF ST. PETERSBURG
PROPOSED PORT and CHANNEL DREDGING

Port of St. Petersburg Basin/Channel Dredging Project
(Economic Restudy)

Estimated Federal Cost	$75,000
Estimated Non-Federal Cost	50,000
Federal Funds Through FY 86	25,000
Non-Federal Funds Through FY 86	0
President's Budget	(50,000)*
State of Florida Request FY 87	75,000

* Available from FY 86 funds if Reconnaissance Study approved and cost sharing provided.

Project History/Description

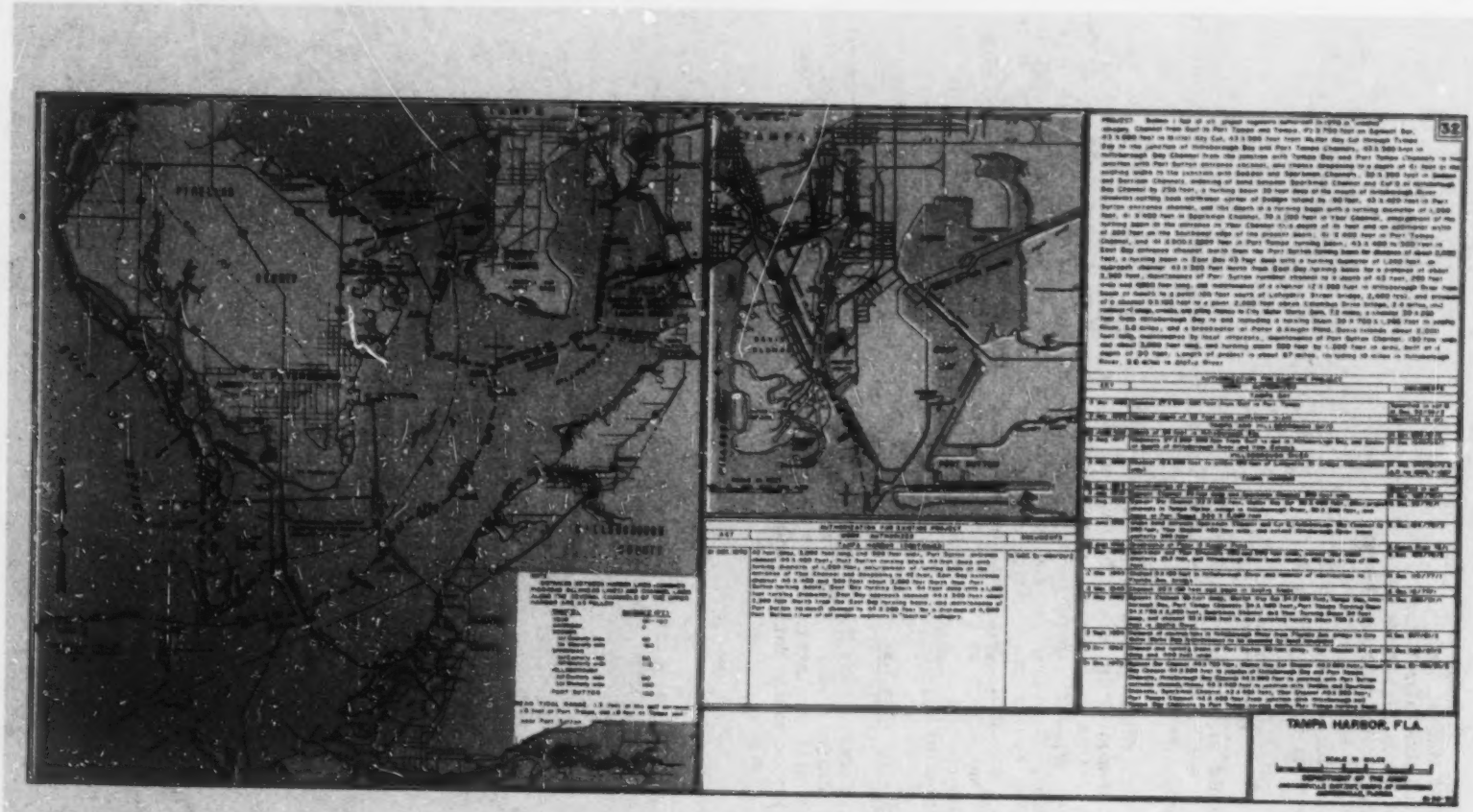
The City of St. Petersburg is submitting an initial request for FY 87 funds to dredge the Port channel and basin. Although the current depth of 22 feet is sufficient for most of the ship traffic through the harbor, the Port seeks to promote the development of substantial cruise ship activity in St. Petersburg. This activity has a controlling depth need of 24-27 feet.

The Corps conducted a benefit/cost analysis of a 24-foot depth in 1981, and found that such a project, without cruise ship activity, could not be economically justified. If the Port is included in the budget, a new benefit/cost analysis will be conducted to determine the economic impacts of cruise ship traffic. The Port currently has some form of commitments from a small number of cruise ships.

Project Justification

A Comprehensive Plan developed by the city in 1979, as well as a Port Master Plan written by private consultants in 1982, indicate that growing levels of tourism and resident population will generate increasing levels of cruise ship activity. While the two plans note that the Port is relatively unattractive due to geographic location, competition from more desirable ports, lack of facilities/space, and deed restrictions, there are advantages. These include a spill-over of cruise activity to the Port as other harbors become overly-congested, access to an attractive international airport, and proximity to an expanding tourist market in the Gulf of Mexico. Both plans look to an expansion of cargo handling as a secondary Port activity.

The city contends that existing tidal and wind conditions, as well as cruise ship operating experience, indicate that design considerations and known safety margins are inadequate. Dredging would provide navigational safety improvement and ability to provide for cruise ship operations. Cruise ships can provide economic benefits to the city, region, and state.



TAMPA HARBOR, FLA.

Tampa Harbor Deepening Project
(Construction)

Estimated Federal Cost	$42,800,000
Estimated Non-Federal Cost	14,698,000
Federal Funds Through FY 86	525,000
Non-Federal Funds Through FY 86	0
President's Budget	7,400,000
State of Florida Request FY 87	7,400,000
Benefit Cost Ratio: 2.3 to 1	

Project History/Description

This would begin construction of the deepening of "Cut D" and Sparkman Channel from 34 feet to 40 feet. The deepening of the main shipping channel should be completed with FY 86 funds.

In 1978, concerns arose as to whether the dredging associated with the Tampa Harbor Deepening Project might have an adverse effect on the Floridan Aquifer. It was thought that deepening the existing channel might breach the top of the Floridan Aquifer, thereby increasing outward flow or allowing salt water intrusion, depending on the potentiometric head. In 1979, a study was initiated by the Tampa Office of the USGS to address this issue. The study report indicated that the Tampa Harbor Channel dredging will have no significant effect on the Floridan, but dredging further to the north may have more adverse impacts. This possibility is to be addressed before construction is allowed to begin.

Project Justification

Benefits accrue from the lower costs of transporting goods in more economical, deeper draft vessels. For Tampa Harbor, approximately 80 percent of this benefit will be attributed to cheaper shipments of phosphate ore products. Tampa Harbor is the nation's eighth largest port in terms of tonnage.

Beach Erosion Control

25. Brevard County Beaches
26. Broward County Beaches-
    John U. Lloyd Park
27. Cape Canaveral Beach
    Renourishment
28. Captiva Island
29. Dade County Beaches
30. Dade County North of Haulover
31. Duval County Beaches
32. Flagler County Beaches
33. Florida Statewide Beaches
34. Ft. Pierce Beach Erosion
35. Indian River County Beaches
    (Sebastian Inlet Segment)
36. Indian River County Beaches
    (Vero Beach Segment)
37. Monroe County Beaches
38. North Boca Raton Beaches
39. Sand Key Restoration (Pinellas Co.)
40. Venice-Caspersen Beaches (Sarasota)

BEACH EROSION CONTROL

Brevard County Beaches

Broward County Beaches

(John U. Lloyd State Beach Recreation Area)

Cape Canaveral Beach Renourishment

Captiva Island Beach Nourishment

Dade County Beaches

Dade County Beaches-North of Haulover Beach Park

Duval County Beach Renourishment

Flagler County Beach Erosion Control

Florida Statewide Beaches

Fort Pierce Beach

Indian River County Beach Nourishment: Sebastian Inlet Component

Indian River County Beach Nourishment: Vero Beach Component

Monroe County Beach Erosion Control

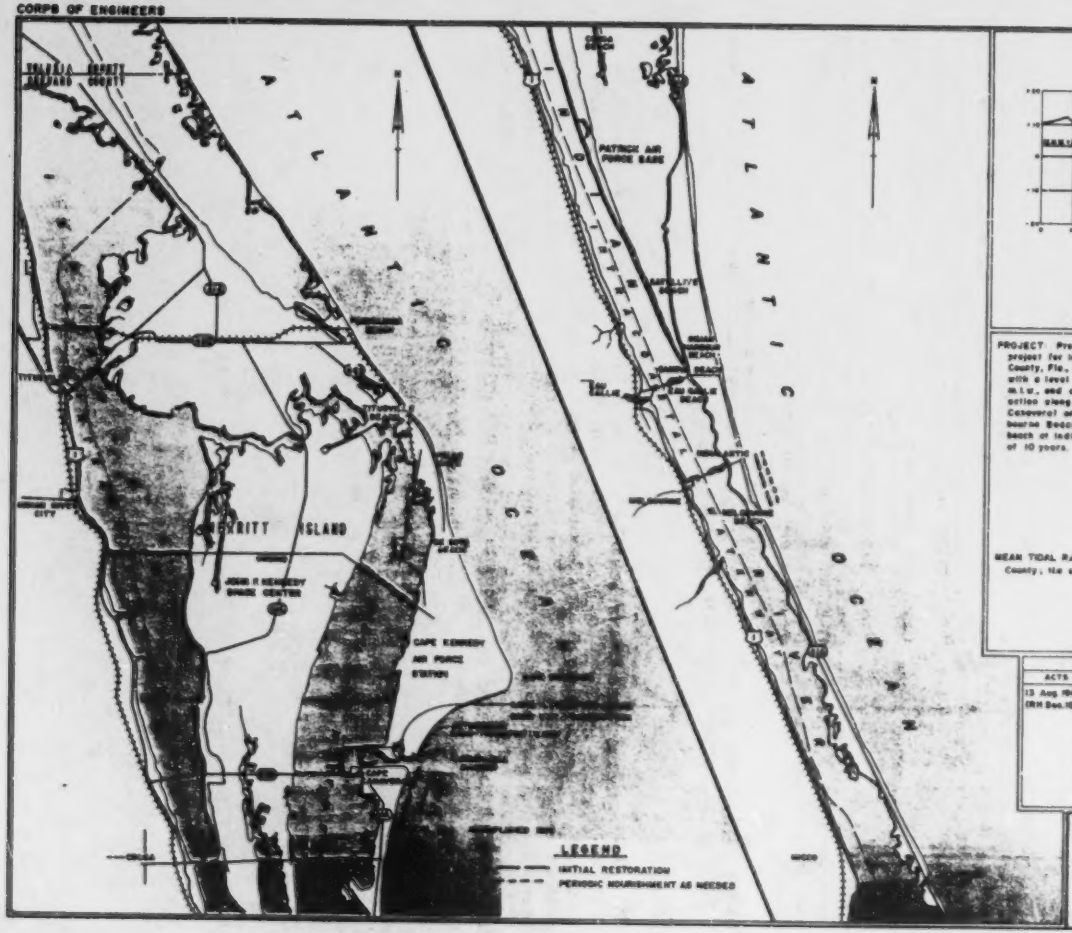
North Boca Raton Beach Restoration

Pinellas County

Sarasota County Beaches (Venice/Caspersen Beach)

CORPS OF ENGINEERS

U. S. ARMY



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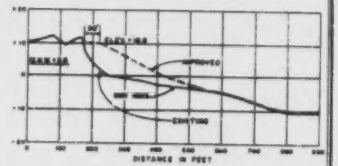


TYPICAL SECTION
CITY OF CAPE CANAVERAL

PROJECT: Provides for Federal participation in the cost of a project for improvement and protection of the shores of Brevard County, Fla., by providing a protective and recreational beach with a level berm 50 feet wide at elevation 10 feet above m.t.w., and a natural slope as would be shaped by wave action along 2.0 miles of beach at the city of Cape Canaveral and 2.0 miles of beach at Indialantic and Melbourne Beach, and for periodic nourishment of the restored beach at Indialantic and Melbourne Beach for an initial period of 10 years.

MEAN TIDAL RANGE: 3.9 feet in the Atlantic Ocean at Brevard County; the spring range is 4.1 feet.

AUTHORIZATION FOR EXISTING PROJECT

ACTS	WORK AUTHORIZED	DOCUMENTS
13 Aug 1968 (RH Doc.102)	Federal participation in cost of shore-protection project.	H. Doc 352/90/2

BREVARD COUNTY, FLORIDA
BEACH EROSION CONTROL

SCALE IN FEET

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
8-30-76

887

Brevard County Beaches
(Study)

Estimated Federal Cost	$264,000
Estimated Non-Federal Cost	154,000
Federal Funds Through FY 86	110,000
Non-Federal Funds Through FY 86	0
President's Budget	0
State of Florida Request FY 87	154,000

Project History/Description

This study is essentially an update of a 1967 beach erosion study. Brevard County is located on the east central Florida coast and includes Cape Canaveral and the John F. Kennedy Space Center. The 1967 study recommended restoration of the Cape Canaveral and the Indialantic-Melbourne Beach areas. These two projects were completed in 1975 and 1980, respectively, and periodic renourishment was recommended for both projects. Continued erosion of these restored areas and of the County's unrestored beaches has brought about a need for restudy of current annual erosion rates, projected impact of continued erosion, and estimated schedule for renourishment. The study would also provide specific recommendations for erosion control. The Corps of Engineers has agreed that a restudy of beach erosion problems in Brevard county is needed.

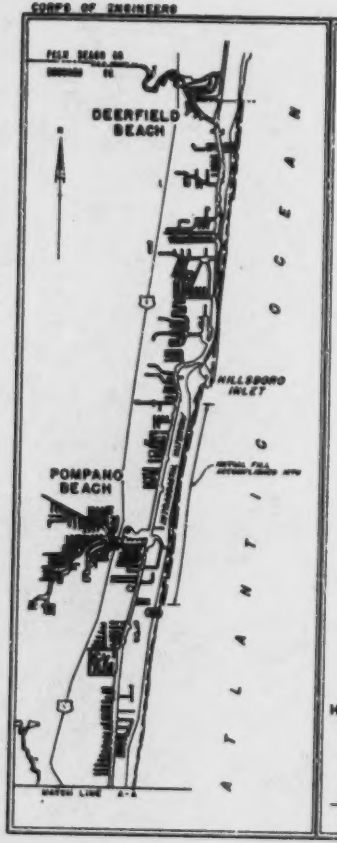
Since this study would update a previously authorized study, no new Congressional authorization is needed.

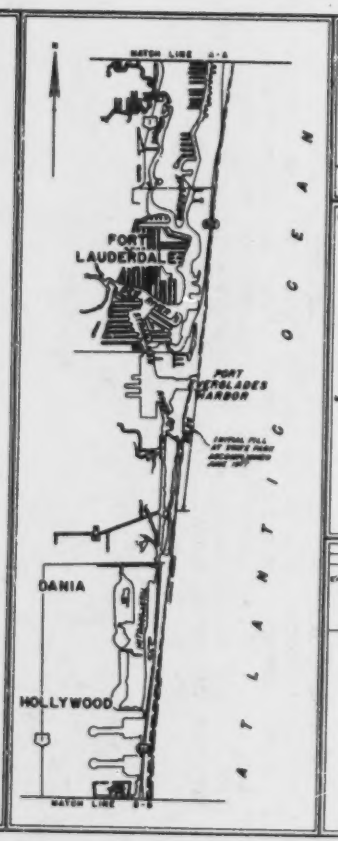
Project Justification

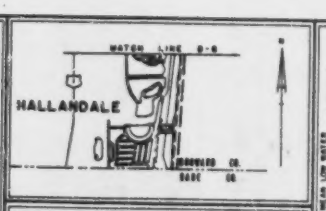
This study would determine the amount of material required to replenish sand lost to erosion by wave action, the renourishment schedule, and methods to reduce erosion. The replenished sand would provide a barrier that would protect upland structures from erosion and reduce or eliminate maintenance costs for structures now in place that were designed to reduce storm damage to the beach. The addition to the beach would provide enhanced and additional recreational areas for residents, and for tourists who comprise a major source of income for the area.

CORPS OF ENGINEERS

U S ARMY





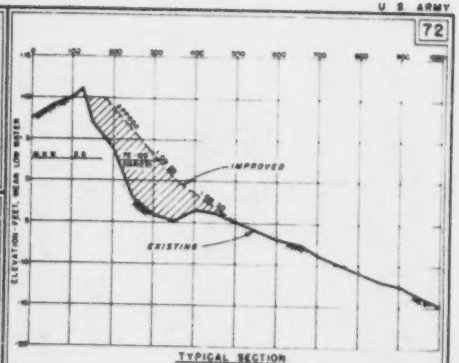


PROJECT. This improvement is the beach erosion part of the project entitled "Broward County Beach Erosion Control and Hillsboro Inlet Navigation Project", and consists of improvements in Broward County, Fla., from the north county line to Hillsboro inlet and from Port Everglades to the south county line, and a combined beach erosion control and navigation improvement of Hillsboro inlet and the shore south thereof to Port Everglades. The beach erosion control features comprise restoration of a protective beach to a general width of 100 feet with berm elevation of 10 feet above mean low water and periodic nourishment thereof. Navigation features would provide for a channel 8 feet deep and 100 feet wide from the Intracoastal Waterway to a point 1,500 feet seaward in Hillsboro Inlet, thence 10 feet deep and 150 feet wide to deep water in the Atlantic Ocean, jetties on the north and south sides of the ocean entrance, and a permanently based floating dredge to maintain the navigation channel and transfer sand across the inlet with a provision for replacement by a trestle mounted sand-transfer plant if necessary. Navigation features are inactive.

MEAN TIDAL RANGE 2.0 feet in the Atlantic Ocean at Fort Lauderdale

AUTHORIZATION FOR EXISTING PROJECT

ACT	WORK AUTHORIZED	DOCUMENT
[illegible]	Improvements for beach erosion control in Broward County, Fla., and a combined beach erosion and navigation improvement to Hillsboro inlet and the shore south thereof to Port Everglades.	H. Doc. 91/85/1



LEGEND

- – – – PERIODIC NOURISHMENT AS NEEDED
- —— INITIAL RENOURISHMENT

BROWARD COUNTY AND HILLSBORO INLET, FLA
BEACH EROSION CONTROL AND NAVIGATION

SCALE IN MILES

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

D-80-77

688

Broward County Beaches
(John U. Lloyd State Beach Recreation Area)
(Construction)

Estimated Federal Cost	$18,500,000
Estimated Non-Federal Cost	22,400,000
Federal Funds Through FY 86	11,033,000
Non-Federal Funds Through FY 86	16,293,000
President's Budget	4,000,000
State of Florida Request FY 87	4,000,000
Benefit Cost Ratio: 27 to 1	

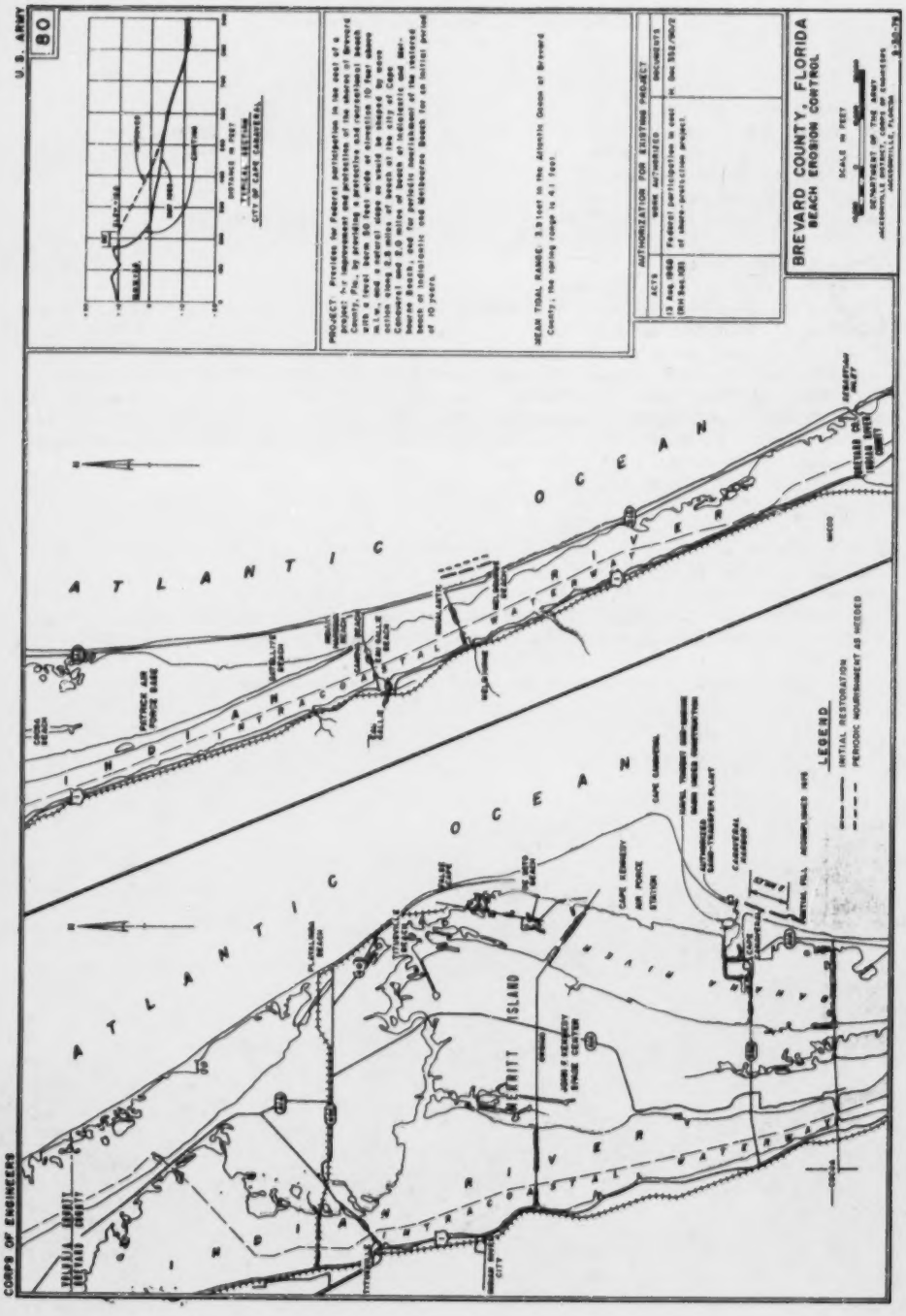
Project History/Description

The project is to renourish approximately 1.5 miles of beach extending to the south of Port Everglades' south jetty on Florida's southeast Atlantic Coast. The request is for reimbursement to Broward County of $3,735,000 for renourishment with 889,088 cubic yards of fill. Placement of the fill is scheduled for the summer of 1986. The project was authorized by Congress in 1965 with initial renourishment accomplished in 1976. The project area is a portion of the John U. Lloyd State Park Recreation Area which the Department of Natural Resources' Division of Beaches and Shores states is badly eroded and in need o. renourishment.

Erosion and shoreline recession of the beach during the nine years since renourishment has threatened the integrity of the seawall at the U.S. Navy's Surface Weapons center next to Port Everglades' south jetty and resulted in the loss of recreational beach space at the State Recreation Area. This project would return the beach to the original design specifications.

Project Justification

John U. Lloyd State Beach Recreation Area is a facility catering to residents and tourists interested in enjoying beach-related activities. Offered are nature walks, fishing, canoeing, swimming, skin and scuba diving, and sunbathing. An adequate beach area is required to fully provide these activities. The design beach would also provide protection for upland structures now threatened by wave action.


U.S. ARMY
80
TYPICAL SECTION
CITY OF CAPE CANAVERAL
PROJECT Provides for Federal participation in the cost of a project for improvement and protection of the shores of Brevard County, Florida, by periodic sand (nourishment) beach with 25 foot berm 50 feet seaward of the existing mean high water line (m.h.w.), and a natural slope as would be shaped by wave action along 2.5 miles of beach of the city of Cape Canaveral and 2.0 miles of beach of Indialantic and Melbourne Beach and for periodic nourishment of the restored beach of Indialantic and Melbourne Beach for an initial period of 10 years.
MEAN TIDAL RANGE 3.9 feet in the Atlantic Ocean at Brevard County, the spring range is 4.1 feet
AUTHORIZATION FOR EXISTING PROJECT
WORK AUTHORIZED
ACTS
DOCUMENTS
19 Aug 1948 (Pub 845-80th)
Federal participation in cost of shore protection project
H. Doc 552/80/2
BREVARD COUNTY, FLORIDA
BEACH EROSION CONTROL
SCALE IN FEET
DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT
CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
ATLANTIC OCEAN
INDIAN RIVER
INTRACOASTAL WATERWAY
PATRICK AIR FORCE BASE
CAPE CANAVERAL
CAPE KENNEDY AIR FORCE STATION
MERRITT ISLAND
JOHN F. KENNEDY SPACE CENTER
LEGEND
INITIAL RESTORATION
PERIODIC NOURISHMENT AS NEEDED

Cape Canaveral Beach Renourishment
(Construction)

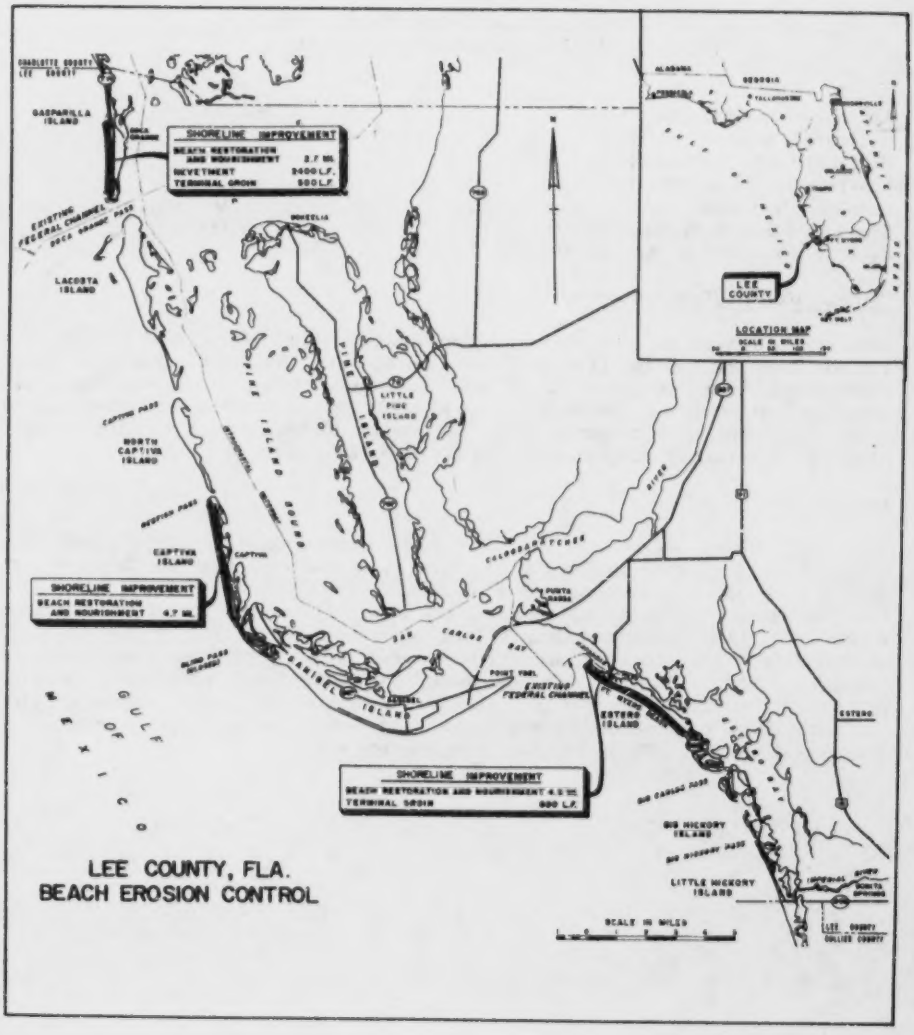
Estimated Federal Cost	$2,000,000
Estimated Non-Federal Cost	To Be Determined
Federal Funds Through FY 86	0
Non-Federal Funds Through FY 86	0
President's Budget	0
State of Florida Request FY 87	1,000,000

Project History/Description

This is an ongoing periodic renourishment project of one of the Brevard County beaches. This two-mile section of beach was last restored in 1974-75 with 2,000,000 cubic yards of dredged fill material and has a life expectancy of 10 years. It has since become critically eroded with approximately 60 percent of the restored beach lost to erosion. Renourishment is scheduled for the 1986-87 time frame. Suitable material is available from a stockpile on the Cape Canaveral Air Force Station or possibly from the construction of the proposed west turning basin at Port Canaveral, if that project is initiated in time.

Project Justification

Renourishment of the 2.0 miles of restored beach will afford maximum protection against erosion and storms to two public oceanfront parks and numerous public beach access routes. It will provide a greater expanse of heavily used beach for recreational purposes. In addition, it will afford protection to private single and multifamily structures which provide a tax base for the County and City of Cape Canaveral. It is also expected to enhance the tourist trade in this area. There is a possible conflict with sea turtle nesting.


SHORELINE IMPROVEMENT
BEACH RESTORATION AND NOURISHMENT 2.7 MI.
REVETMENT 2400 L.F.
TERMINAL GROIN 500 L.F.
SHORELINE IMPROVEMENT
BEACH RESTORATION AND NOURISHMENT 4.7 MI.
SHORELINE IMPROVEMENT
BEACH RESTORATION AND NOURISHMENT 4.5 MI.
TERMINAL GROIN 600 L.F.
GASPARILLA ISLAND
LACOSTA ISLAND
NORTH CAPTIVA ISLAND
CAPTIVA ISLAND
CAPTIVA PASS
BOCA GRANDE PASS
EXISTING FEDERAL CHANNEL
PINE ISLAND
LITTLE PINE ISLAND
MATLACHA PASS
SAN CARLOS BAY
CALOOSAHATCHEE RIVER
SANIBEL ISLAND
ESTERO ISLAND
BIG HICKORY ISLAND
LITTLE HICKORY ISLAND
BIG CARLOS PASS
BIG HICKORY PASS
GULF OF MEXICO
LEE COUNTY
LOCATION MAP
SCALE IN MILES
LEE COUNTY, FLA.
BEACH EROSION CONTROL
SCALE IN MILES

Captiva Island Beach Nourishment
(Advanced Engineering and Design)

Estimated Federal Cost	$65,000
Estimated Non-Federal Cost	0
Federal Funds Through FY 86	40,000
Non-Federal Funds Through FY 86	0
President's Budget	0
State of Florida Request FY 87	20,000

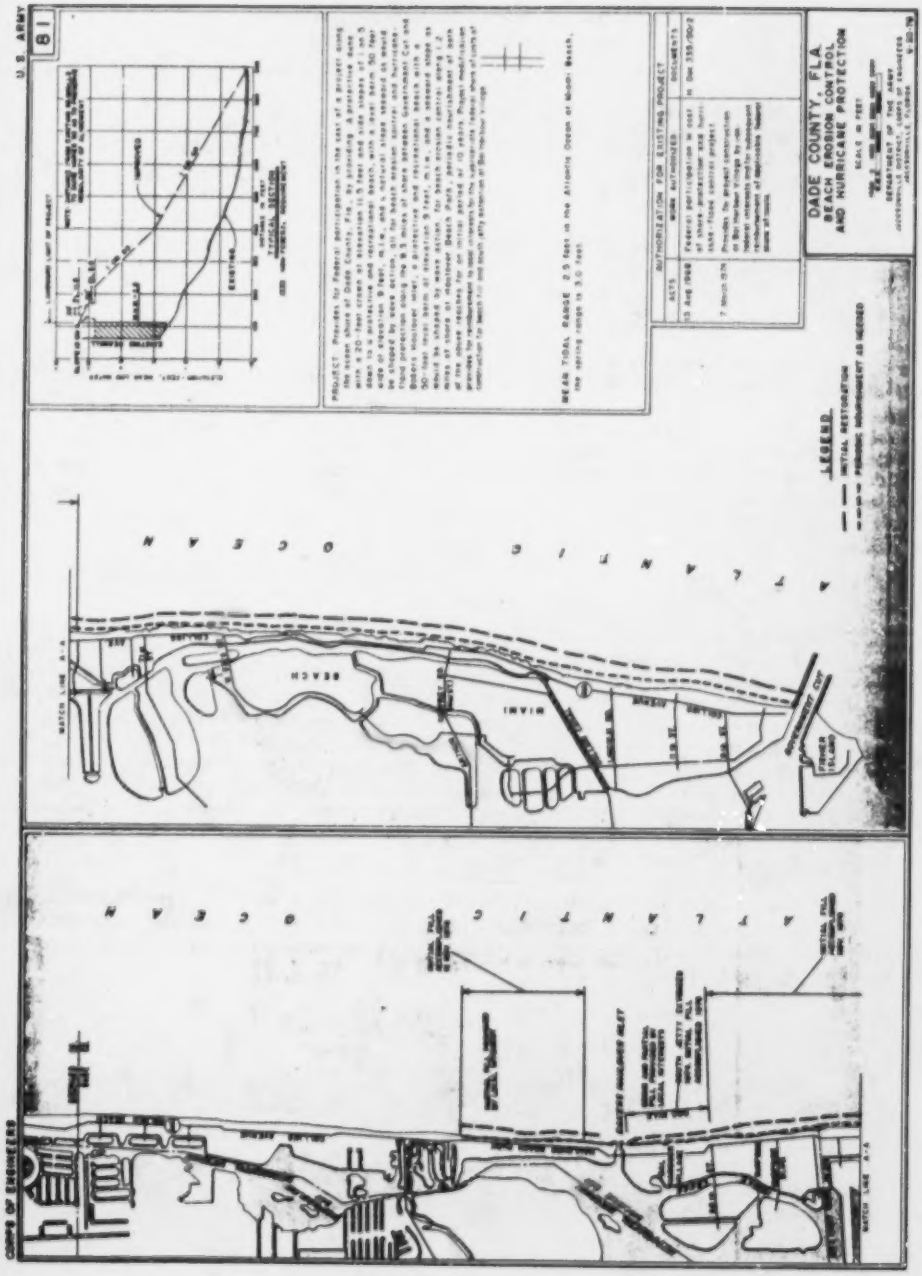
Benefit Cost Ratio: Not determined

Project History/Description

Captiva Island is on Florida's southwest coast near Fort Myers. This is a request from the Captiva Erosion Prevention District for reimbursement of beach restoration costs for 3.0 miles of beach on Captiva Island. The restored beach would be approximately 100 feet wide and would be constructed in two phases by local interests in accordance with the overall federal Beach Erosion Control Study for Lee County completed by the Corps of Engineers in 1969.

Project Justification

In 1969, at the request of the Lee County Commission, the Corps prepared a study on beach erosion in Lee County. The study reported that the beaches were severely eroded and recommended a Federal project of beach nourishment for erosion control. Historical records show over 700 feet of shoreline recession since 1906, with a maximum annual loss of more than 39 feet. Erosion rates measured from 1967 to 1979 are three to four cubic yards per linear foot of beach per year. This project, by renourishing the beach area, would provide protection to upland property, provide hurricane and storm protection for portions of a road which is the only land access and emergency evacuation route, and provide additional public recreation area.


U.S. ARMY
81
DADE COUNTY, FLA.
BEACH EROSION CONTROL
AND HURRICANE PROTECTION
LEGEND
OCEAN
ATLANTIC
BEACH
MIAMI
CORPS OF ENGINEERS

Dade County Beach Erosion Control and
Hurricane Protection Project
(Construction)

Estimated Federal Cost	$48,600,000
Estimated Non-Federal Cost	40,800,000
Federal Funds Through FY 86	34,144,000
Non-Federal Funds Through FY 86	26,396,000
Estimated Federal Funding Requirements FY 87	2,000,000
President's Budget	2,000,000
State of Florida Request FY 87	2,000,000

Benefit Cost Ratio: 3.8:1.0

Project History/Description

This project is intended to provide renourishment, as needed, for Dade County's recently completed Beach Erosion Control and Hurricane Protection Project. The overall project involved the dredging and placing of 14 million cubic yards of material to form a protective and recreational beach and protective dune for 9.3 miles of shoreline between Government Cut on the south and Bakers Haulover on the north. This shoreline is adjacent to Miami Beach, Surfside, and Bal Harbour Village. Beach construction was first completed in 1982, but average annual renourishment need is projected to be 210,000 cubic yards. The renourishment material is being obtained from off-shore areas by dredging.

Project Justification

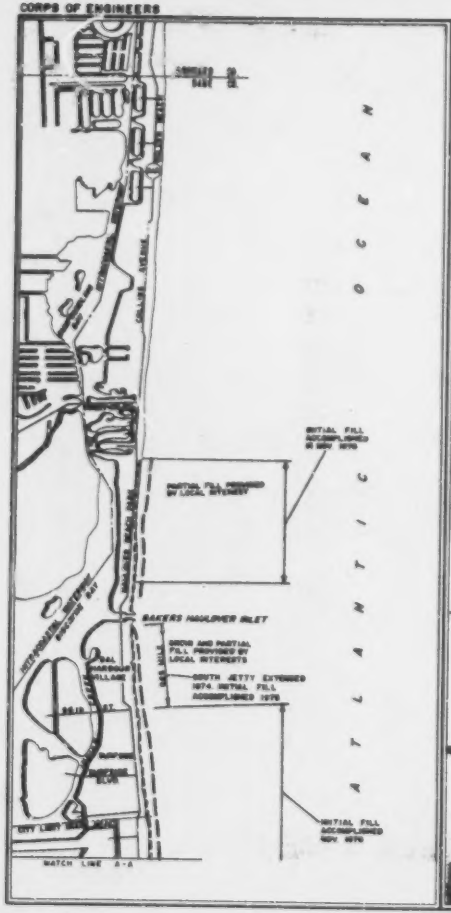
Beach erosion in the project area results from a combination of factors including prevailing winds, swells, beach development, protective structures, and the presence of artificial inlets. Recreational beach has been lost, beach-front property is threatened with erosion, and seawalls have come under direct attack of waves. Many of the problems now associated with the subject shoreline are the direct result of shoreline alterations made without knowledge of the sediment transport mechanisms in the area or without regard for the protective value and sediment supply of the beach/dune system. Though expensive and energy-intensive, beach renourishment in the project area seems essential to provide storm protection and recreational benefits for an area of immense economic importance.

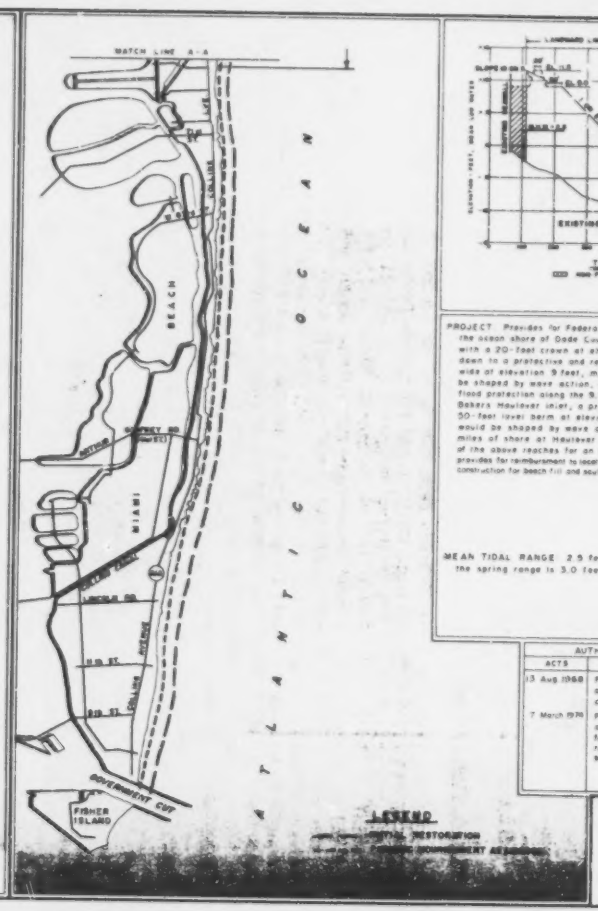
As with most beach restoration projects in Southeast Florida, potential beach damage to nearshore reefs has been the major controversy associated with this project. Dade County has requested the Corps to emphasize innovative means of solving this problem.

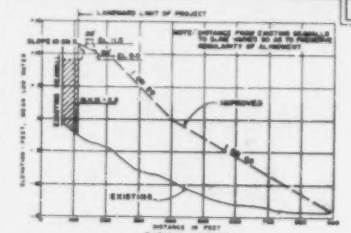
CORPS OF ENGINEERS

U. S. ARMY

81


ATLANTIC OCEAN
INITIAL FILL ACCOMPLISHED IN NOV 1970
INITIAL FILL PROVIDED BY LOCAL INTERESTS
BAKERS HAULOVER INLET
DREDGING AND PARTIAL FILL PROVIDED BY LOCAL INTERESTS
SOUTH JETTY EXTENDED 1970. INITIAL FILL ACCOMPLISHED 1970
INITIAL FILL ACCOMPLISHED NOV 1970
BAKERS HAULOVER CANAL
HAULOVER BEACH PARK
COLLINS AVENUE
CITY LIMIT SIGN NORTH
WATCH LINE A-A





TYPICAL SECTION

PROJECT Provides for Federal participation in the cost of a project along the ocean shore of Dade County, Fla., by providing A protective dune with a 20-foot crown at elevation +15 feet and side slopes of 1 on 5 down to a protective and recreational beach, with a level berm 50 feet wide at elevation 9 feet, m.l.w., and a natural slope seaward as would be shaped by wave action, all for beach erosion control and hurricane-flood protection along the 9.3 miles of shore between Government Cut and Bakers Haulover Inlet, a protective and recreational beach with a 50-foot level berm at elevation 9 feet, m.l.w., and a seaward slope as would be shaped by wave action, for beach erosion control along 1.2 miles of shore at Haulover Beach Park, periodic nourishment at both of the above reaches for an initial period of 10 years. Project modification provides for reimbursement to local interests for the appropriate federal share of costs of construction for beach fill and south jetty extension at Bal Harbour Village

MEAN TIDAL RANGE 2.9 feet in the Atlantic Ocean at Miami Beach, the spring range is 3.0 feet

AUTHORIZATION FOR EXISTING PROJECT		
ACTS	WORK AUTHORIZED	DOCUMENTS
13 Aug 1968	Federal participation in cost of shore-protection and hurricane-flood control project	H Doc 335/90/2
7 March 1970	Provides for project construction at Bal Harbour Village by non-federal interests and for subsequent reimbursement of applicable federal share of costs	

DADE COUNTY, FLA.
BEACH EROSION CONTROL AND HURRICANE PROTECTION

SCALE IN FEET

0 1000 2000 3000 4000 5000

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
9-30-70

Dade County Beaches - North of Haulover Beach Park
(Construction)

Estimated Federal Cost	$13,000,000
Estimated Non-Federal Cost	12,100,000
Federal Funds Through FY 86	794,000
Non-Federal Funds Through FY 86	700,000
President's Budget	6,000,000
State of Florida Request FY 87	6,000,000
Benefit Cost Ratio: 2.5 to 1	

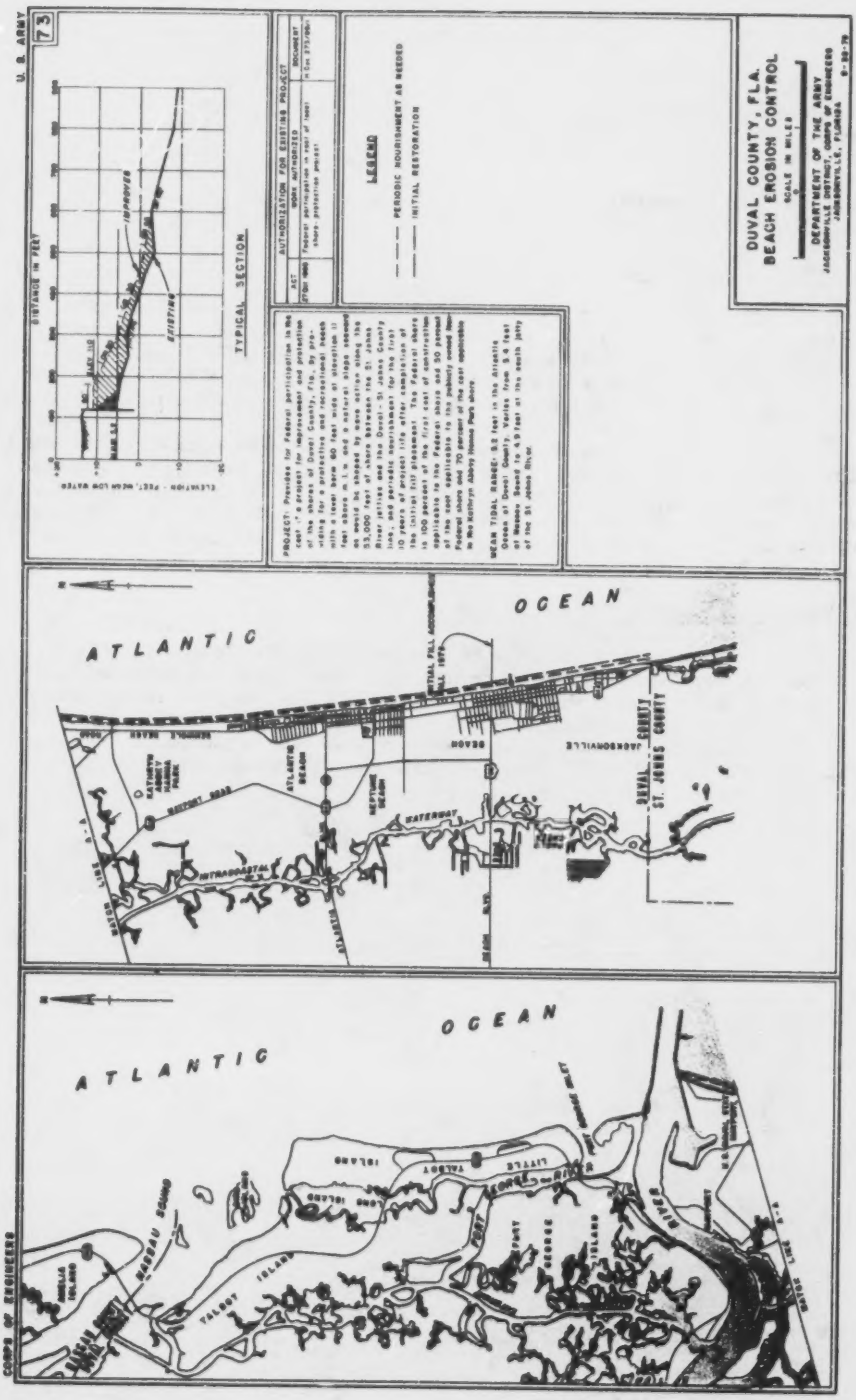
Project History/Description

This is a project proposed by Dade County to provide control of beach erosion and hurricane-induced flooding for the coastal area extending 2.5 miles north of Haulover Beach Park. Construction of this project was authorized by the Supplemental Act of 1985.

Project Justification

Beach erosion in the project area results from a combination of factors including prevailing winds, swells, storms, beach development, protective structures, and the presence of artificial inlets. Recreational beach has been lost. Beach front property is threatened with erosion, and seawalls have come under direct wave action. Many of the problems now associated with the subject shoreline are the result of shoreline alterations made without knowledge of the sediment transport mechanism in the area or without regard for the protective value and sediment supply of the beach-dune system. A general deficiency in supply of littoral material reaching the area plus the action of littoral barriers have resulted in severe erosion over parts of the project area.

As with most beach renourishment projects in Southeast Florida, potential damage to nearshore reefs has been the major controversy associated with this project. Dade County has recently requested the Corps to place increased emphasis on developing an innovative design to minimize reef damage.


U. S. ARMY
73
TYPICAL SECTION
DISTANCE IN FEET
ELEVATION - FEET, MEAN LOW WATER
EXISTING
IMPROVED
AUTHORIZATION FOR EXISTING PROJECT
LEGEND
PERIODIC NOURISHMENT AS NEEDED
INITIAL RESTORATION
DUVAL COUNTY, FLA.
BEACH EROSION CONTROL
SCALE IN MILES
DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
ATLANTIC
OCEAN
ATLANTIC BEACH
NEPTUNE BEACH
JACKSONVILLE
DUVAL COUNTY
ST. JOHNS COUNTY
INTRACOASTAL WATERWAY
TALBOT ISLAND
CORPS OF ENGINEERS

Duval County Beach Renourishment
(Construction)

Estimated Federal Cost	$16,000,000
Estimated Non-Federal Cost	13,978,000
Federal Funds Through FY 86	9,263,000
Non-Federal Funds Through FY 86	6,712,000
President's Budget	3,200,000
State of Florida Request FY 87	3,200,000
Benefit Cost Ratio: 2.7 to 1	

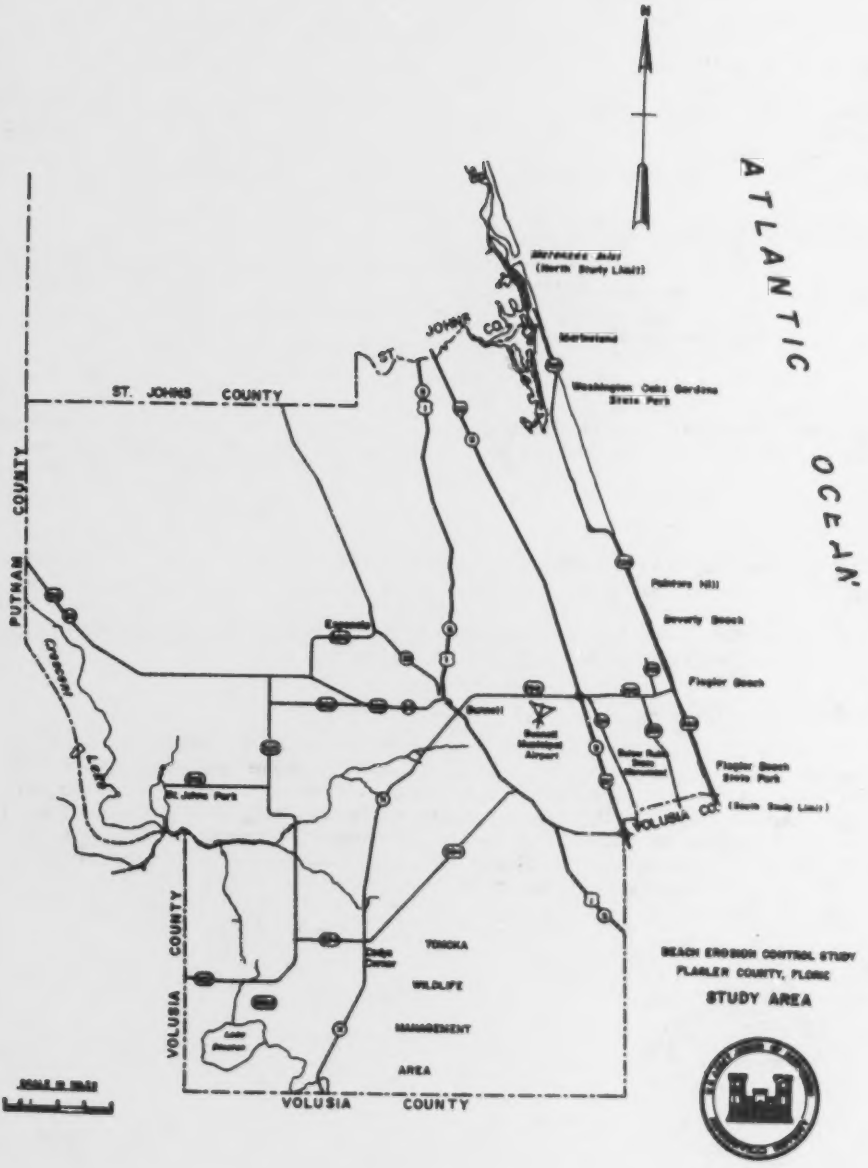
Project History/Description

This renourishment project is to replace sand which has been lost as a result of the combined effects of tides, storms and wind since the original beach renourishment project of 1978-1980. Since completion of the beach nourishment project, there has been a significant loss of beach and the FY 87 request is for renourishment which was planned for and anticipated in the original study.

The Corps anticipates a three-part effort for this renourishment. Sand for the northern half of the project derived from maintenance dredging of Jacksonville Harbor has been placed. The renourishment was originally planned for the summers of 1984, 85 and 86. However, since the DNR did not have adequate matching funds, Phase II and III have been delayed. The original contract has expired; a new one is being negotiated.

Project Justification

Since 1980, considerable beach area has been lost to erosion by winds, tides and "northeasters". Measures to reduce or prevent loss of windblown sand will be studied and applied where possible. This maintenance renourishment is necessary to avert complete loss of beach areas which were created by the original construction program and will reestablish a valuable recreational beach and provide protection for roads and real estate against storm damage.


ATLANTIC OCEAN
ST. JOHNS COUNTY
PUTNAM COUNTY
VOLUSIA COUNTY
VOLUSIA COUNTY
Matanzas Inlet
(North Study Limit)
Marineland
Washington Oaks Gardens State Park
Palm Coast
Beverly Beach
Flagler Beach
Flagler Beach State Park
(South Study Limit)
Crescent Lake
St. Johns Park
Dupont Lake
YONORA
WILDLIFE
MANAGEMENT
AREA
BEACH EROSION CONTROL STUDY
FLAGLER COUNTY, FLORIDA
STUDY AREA

Flagler County Beach Erosion Control
(Study)

Estimated Federal Cost	$135,000
Estimated Non-Federal Cost	0
Federal Funds Through FY 86	20,000
Non-Federal Funds Through FY 86	0
President's Budget	0
State of Florida Request FY 87	115,000

Project History/Description

Flagler County is in northeastern Florida about 50 miles south of Jacksonville. This study was initiated in 1977 to assess the condition and erosion problems of the beaches of Flagler County and to develop appropriate recommendations and corrective measures where necessary.

Much of the shoreline of Flagler County is undeveloped. Flagler Beach and Marineland are the primary developments along the beach. About one-third of the County oceanfront along Highway A1A is open to the public. The highway itself is susceptible to erosion and is within 100 feet of the mean high water line along most of the southern county oceanfront. Although much of the shoreline area presently is not developed, a massive residential community (ITT Palm Coast) is being constructed in the northern part of the county.

A reconnaissance report completed in 1980 concluded that a beach nourishment project was not economically justifiable for this beach area due to the small population. However, the local sponsor has requested that the feasibility study be completed so that nonstructural alternatives can be identified. Thus, FY 87 funding will be needed to complete it.

Project Justification

The primary benefit of this study is that it would increase the amount of technical data on the erosion and storm damage processes along the Flagler County coastline. This information and the alternatives designed by the Corps could then be used by local governments to guide development of the coastal area and adjacent uplands. The use of planning to prevent shoreline erosion problems seems much more reasonable than using structural techniques to correct the damage that would be allowed by lack of planning.

FLORIDA STATEWIDE BEACHES STUDY

904

Florida Statewide Beaches Study
(Coast of Florida Erosion and Storm Effects Study)

Estimated Federal Cost	$5,520,000
Estimated Non-Federal Cost	8,400,000
Federal Funds Through FY 86	770,000
Non-Federal Funds Through FY 86	0
President's Budget	750,000
State of Florida Request FY 87	1,525,000

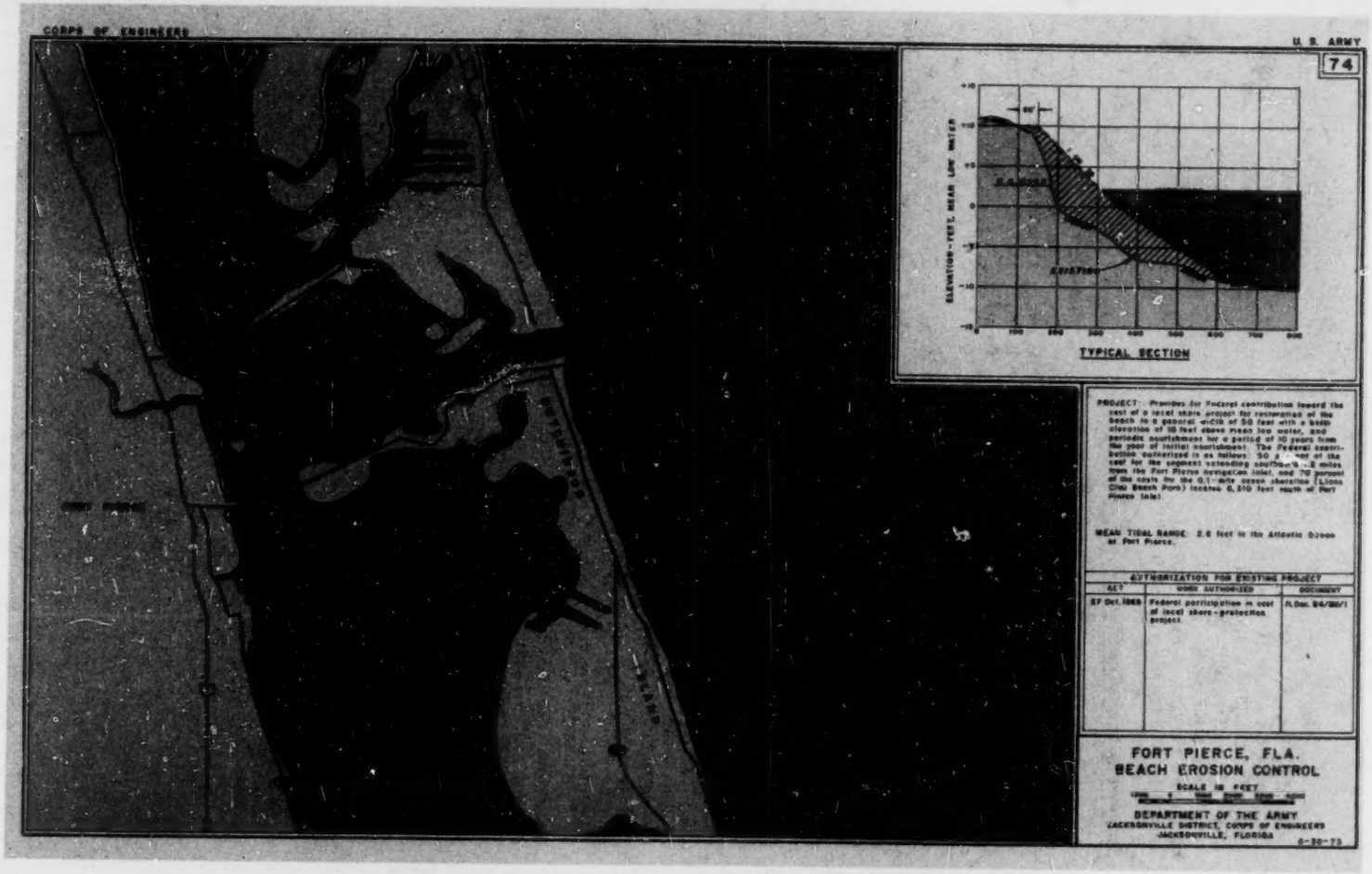
Project History/Description

This proposal by the Florida Department of Natural Resources is for continuation of a statewide study of the status and dynamics of the coastal processes affecting Florida's beaches. The study will provide a much improved technical basis for assessing future coastal changes (whether man-induced or natural) by systematically collecting essential data and identifying the factors that cause coastal changes. The study objectives are to document, quantify, and understand coastal changes and processes along physiographic regions encompassing Florida's shoreline with a view of developing and evaluating alternatives for protecting upland property from damage by erosion, storm surge and waves and for reducing the cost of nourishment of existing Federal beach erosion control projects and maintenance of navigation projects.

Project Justification

The coast of Florida, which includes 800 miles of high-quality sand beaches, is an extremely valuable state natural resource. This study will provide vital information for coastal resource management. Benefits will include: 1) a better scientific basis for decisions on coastal development, 2) improved effectiveness and reduced costs of future and existing coastal works, 3) an improved basis for preventing storm damages, 4) an improved basis for regulatory decisions, such as the coastal construction control line, and 5) a better understanding of the long-term effects of rising sea level.

The recent damage done to much of Florida's central and northern Gulf Coast by Hurricane Elena demonstrates the need for this study.


CORPS OF ENGINEERS
U. S. ARMY
74
TYPICAL SECTION
PROJECT: Provides for Federal contribution toward the cost of a local shore project for restoration of the beach to a general width of 50 feet with a berm elevation of 10 feet above mean low water, and periodic nourishment for a period of 10 years from the year of initial nourishment. The Federal contribution authorized is as follows: 50 p - - -ent of the cost for the segment extending southward 4 - .2 miles from the Fort Pierce navigation inlet, and 70 percent of the costs for the 0.1-mile ocean shoreline (Lions Club Beach Park) located 6,510 feet north of Fort Pierce Inlet.
MEAN TIDAL RANGE: 2.6 feet in the Atlantic Ocean at Fort Pierce.
AUTHORIZATION FOR EXISTING PROJECT
ACT
WORK AUTHORIZED
DOCUMENT
27 Oct. 1965
Federal participation in cost of local shore-protection project
H.Doc. 94/89/1
FORT PIERCE, FLA.
BEACH EROSION CONTROL
SCALE IN FEET
DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
6-30-73

Fort Pierce Beach
(Construction)

Estimated Federal Cost	$3,460,000
Estimated Non-Federal Cost	3,230,000
Federal Funds Through FY 86	0
Non-Federal Funds Through FY 86	0
President's Budget	0
State of Florida Request FY 87	650,000
Benefit Cost Ratio: 2.5:1.0	

Project History/Description

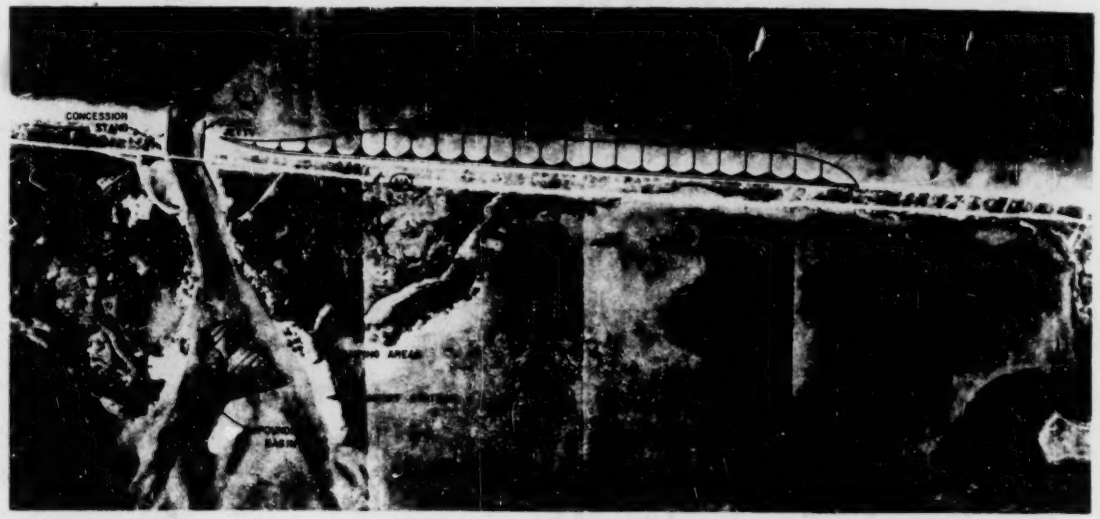
This proposal by St. Lucie County is for the placement of 350,000-450,000 cubic yards of sand on the beach beginning at the south jetty of Ft. Pierce Inlet and extending 1.3 miles to the south. The material would be taken from a borrow area 3,000 feet offshore. The beach to be nourished includes two public parks: South Shore Park (1,210 feet of beach frontage) and Surfside Park (550 feet of beach frontage). Both are fully open to public use.

The effect of sand movement in the longshore direction is most evident at Ft. Pierce Inlet, where the beach just south of the inlet has receded an average of 4.3 feet a year since 1930, while during the same period the beach on the north side has advanced seaward. Previous beach nourishment projects have preserved the beach on the south side from eroding so far inward as to destroy both private and public property. However, most benefits (88%) are attributable to recreation on the beach, rather than property protection. Costs are to be divided almost equally between federal and non-federal interests.

A possible adverse environmental impact of this project is interference with sea turtle nesting. The beaches are used for this purpose from mid-May through late August, with incubation extending into November. The current plan is to conduct beach nourishment, as far as possible, during periods when nesting is not occurring. If necessary, a program to collect and incubate the eggs may be implemented.

Project Justification

Restoring the beach will preserve the existing recreational resource and protect capital investments. The two public beach parks in this area would continue to serve residents and visitors.



LEGEND:

PRIOR WORK BY OTHERS

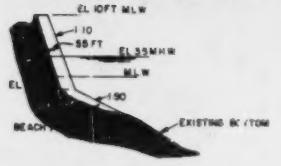
FEDERAL PROJECT RECOMMENDATIONS

BERM TOP ELEVATION 10FT M.L.W

APPROXIMATE TOE OF FILL

OCEANWARD SLOPE
1 ON 10 TO ELEVATION -2FT M.L.W THENCE
1 ON 50 TO EXISTING BOTTOM

AERIAL PHOTO FLOWN JUNE 1974



BEACH FILL DETAILS

SCALE IN FEET

1000 0 1000 2000 3000

BEACH EROSION CONTROL AND
SHORE PROTECTION STUDY
INDIAN RIVER COUNTY, FLORIDA

THE SELECTED PLAN FOR SEBASTIAN INLET STATE PARK

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

APPENDIX I PLATE E-1

Indian River County Beach Nourishment: Sebastian Inlet Component
(Construction)

Estimated Federal Cost	$804,000
Estimated Non-Federal Cost	759,000
Federal Funds Through FY 86	0
Non-Federal Funds Through FY 86	0
President's Budget	0
State of Florida Request FY 87	804,000
Benefit Cost Ratio: 1.4 to 1	

Project History/Description

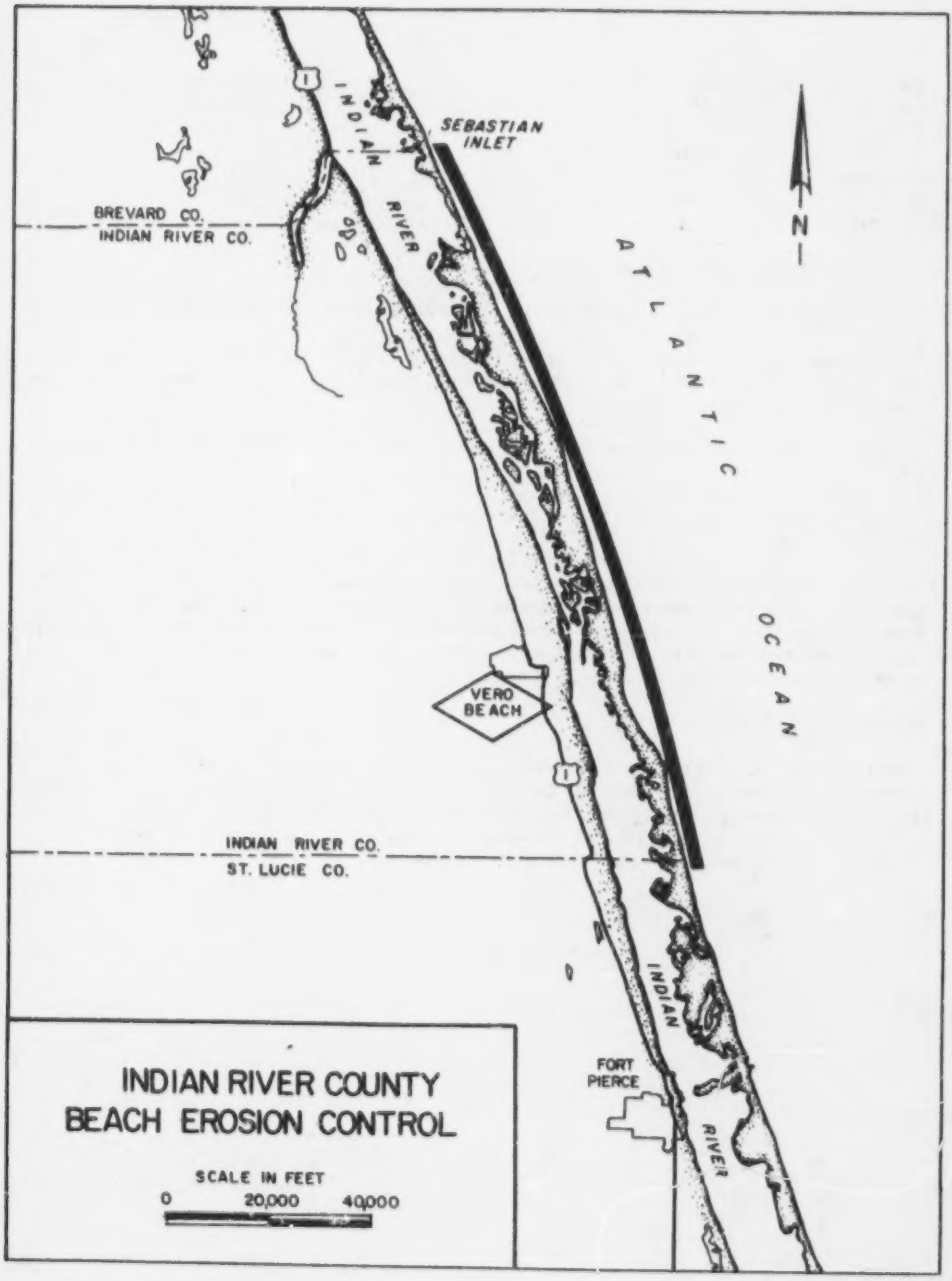
This is the Sebastian Inlet State Park component of the Indian River County beach nourishment project. Sebastian Inlet Tax District is acting as local sponsor for this component; nonfederal costs are expected to be provided by the Florida Department of Natural Resources. The project still needs congressional authorization.

The Sebastian Inlet plan recommended by the Corps involves placing fill along almost the entire shore of the Park, amounting to 1.68 miles. A total of about 202,000 cubic yards of fill would be used for the initial phase of the project. It is estimated that an equal amount of fill would be required every 5 years thereafter. A special environmental hazard of this project is possible effects on the nesting of sea turtles. This region of the coast is an important nesting area for sea turtles (primarily Atlantic loggerheads). Turtle nesting begins during the first week in May and continues through September. The potential harm to sea turtles resulted in a U.S. Fish and Wildlife Service recommendation that the beach nourishment project be conducted only from November to May.

The principal borrow area is located about 3,000 feet offshore, and about 4 miles south of the Park. In addition, it may be possible to use some of the materials from the periodic dredging of Sebastian Inlet.

Project Justification

Benefits to be derived from beach nourishment in this area are increased recreational space provided by the added material and prevention of storm damage to public property. The Sebastian Inlet State Park segment is completely open to public use. Additionally, the project will reduce the need for storm protection structures, such as seawalls, revetments, groins, bulkheads, etc., which in themselves lead to further beach erosion.


SEBASTIAN INLET
INDIAN RIVER
BREVARD CO.
INDIAN RIVER CO.
ATLANTIC OCEAN
N
VERO BEACH
INDIAN RIVER CO.
ST. LUCIE CO.
INDIAN RIVER
FORT PIERCE
INDIAN RIVER COUNTY
BEACH EROSION CONTROL
SCALE IN FEET
0 20,000 40,000

910

Indian River County Beach Nourishment: Vero Beach Component
(Construction)

Estimated Federal Cost	$1,756,000
Estimated Non-Federal Cost	1,943,000
Federal Funds Through FY 86	0
Non-Federal Funds Through FY 86	0
President's Budget	0
State of Florida Request FY 87	1,756,000
Benefit Cost Ratio: 2.1 to 1	

Project History/Description

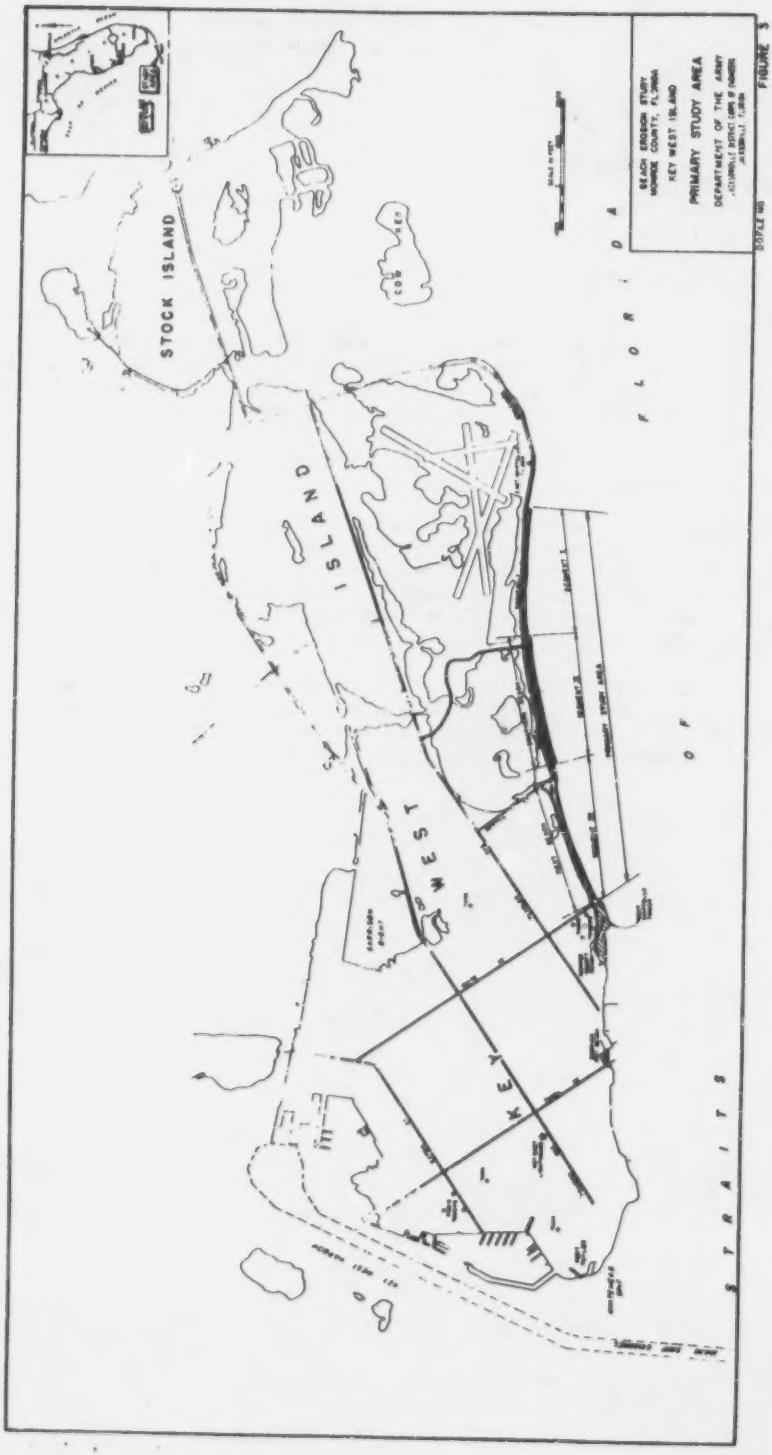
This is the Vero Beach component of the Indian River County beach nourishment project. Both components need congressional authorization. The Vero Beach recommended plan involves 1.74 miles of beach. This phase of the project does not seem to have quite as much potential impact on turtle nesting as the Sebastian Inlet Park component.

There are two principal reasons why the shoreline of Indian River County is eroding. The first is the general rise in sea level being observed worldwide. The second is that the construction of Sebastian Inlet Jetty at the northern end of Sebastian Inlet State Park has blocked the natural southerly movement of offshore sand.

If construction is authorized by Congress, construction could begin soon. At present, the favorable recommendation of the Army Corps of Engineers has not been released by the Assistant Secretary of the Army. The need for the project was emphasized in late 1984, when a heavy storm caused severe erosion along much of Florida's south Atlantic Coast.

Project Justification

Benefits to be derived from beach nourishment in this area are increased recreational space provided by the added material, prevention of storm damage to private and public property, and the reduction of the need for storm protection structures such as seawalls, revetments, groins, bulkheads, etc., which in themselves lead to further beach erosion.


STOCK ISLAND
KEY WEST ISLAND
PRIMARY STUDY AREA
FIGURE 3

Monroe County Beach Erosion Control
(Continued Planning and Engineering)

Estimated Federal Cost	$218,000
Estimated Non-Federal Cost	0
Federal Funds Through FY 86	125,000
Non-Federal Funds Through FY 86	0
President's Budget	0
State of Florida Request FY 87	93,000
Benefit Cost Ratio: 7.5 to 1	

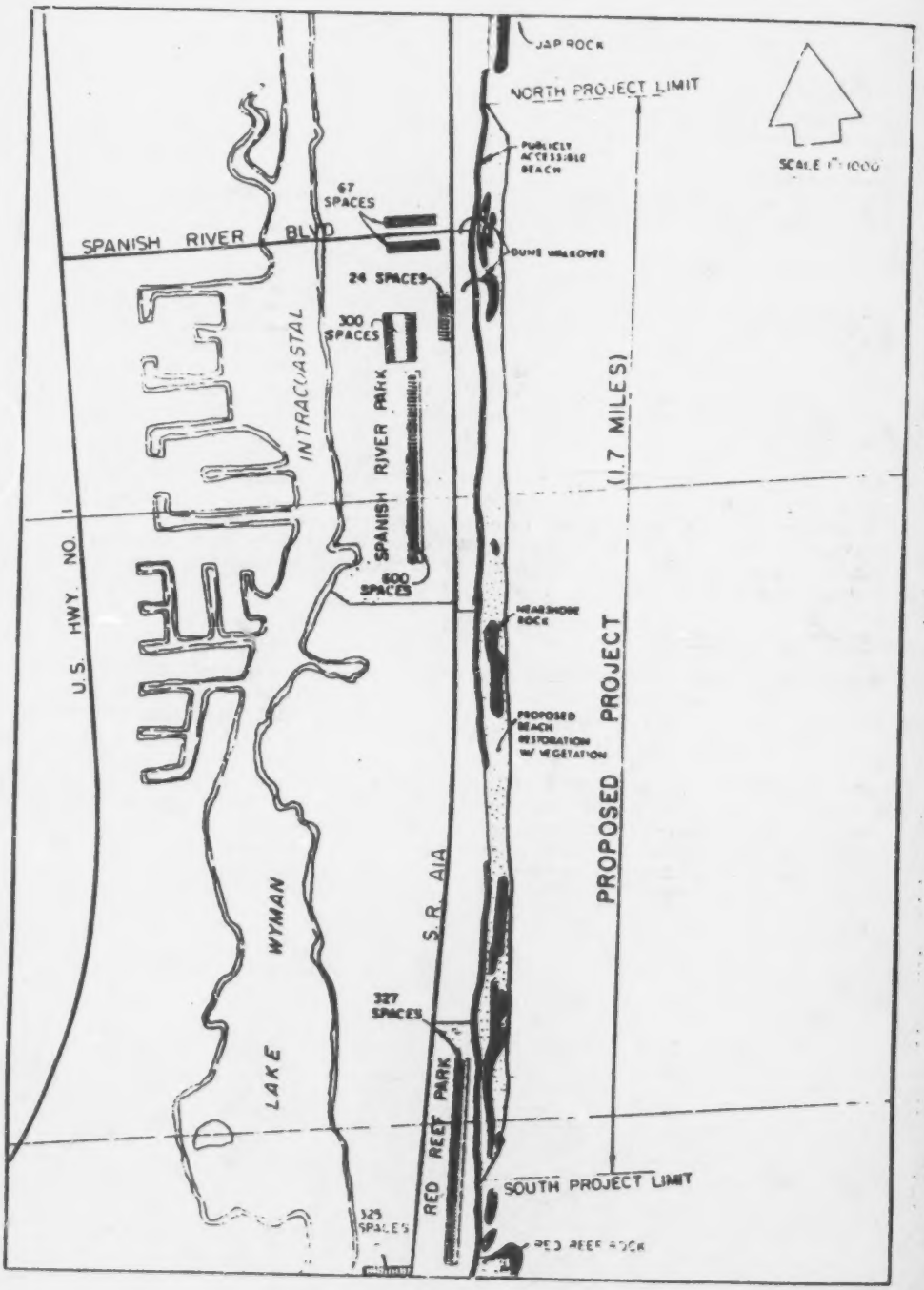
Project History/Description

This project has been requested by the City of Key West to restore Smathers Beach and to fill the adjacent east and west shorelines with sand, to perform periodic nourishment of the beach for 50 years, to construct two groins, and to relocate a boat ramp. The plan also includes filling nearshore depressions and seagrass planting. The overall project could eventually extend for 9,400 feet of beachfront.

Project Justification

The Final Feasibility Report projected an annual gain in recreational resources of $1,007,200 and an annual damage cost savings of $61,200. Against an annual cost of $597,900, this results in a benefit-cost ratio of 1.8:1.0. The project is expected to improve the local tourist economy and provide local employment benefits. The number of users of the beach is projected to increase to 450,000 per year by 1989.

Funding is recommended for planning and engineering for the entire 9400-foot stretch of the project. However, actual construction should be done in phases as supplemental studies demonstrate the need for additional recreational beach areas. Environmental standards will have to be met in the permitting process.


JAP ROCK
NORTH PROJECT LIMIT
PUBLICLY ACCESSIBLE BEACH
SCALE 1"=1000
67 SPACES
SPANISH RIVER BLVD
DUNE WALKOVER
24 SPACES
300 SPACES
INTRACOASTAL
SPANISH RIVER PARK
(1.7 MILES)
U.S. HWY. NO. 1
600 SPACES
NEARSHORE ROCK
PROPOSED BEACH RESTORATION W/ VEGETATION
PROPOSED PROJECT
S.R. A1A
LAKE WYMAN
327 SPACES
RED REEF PARK
SOUTH PROJECT LIMIT
325 SPACES
RED REEF ROCK

914

North Boca Raton Beach Restoration
(Construction)

Estimated Federal Cost	$10,900,000
Estimated Non-Federal Cost	18,400,000
Federal Funds Through FY 86	4,221,000
Non-Federal Funds Through FY 86	8,985,000
President's Budget	1,700,000
State of Florida Request FY 87	1,700,000
Benefit Cost Ratio: 2.7 to 1	

Project History/Description

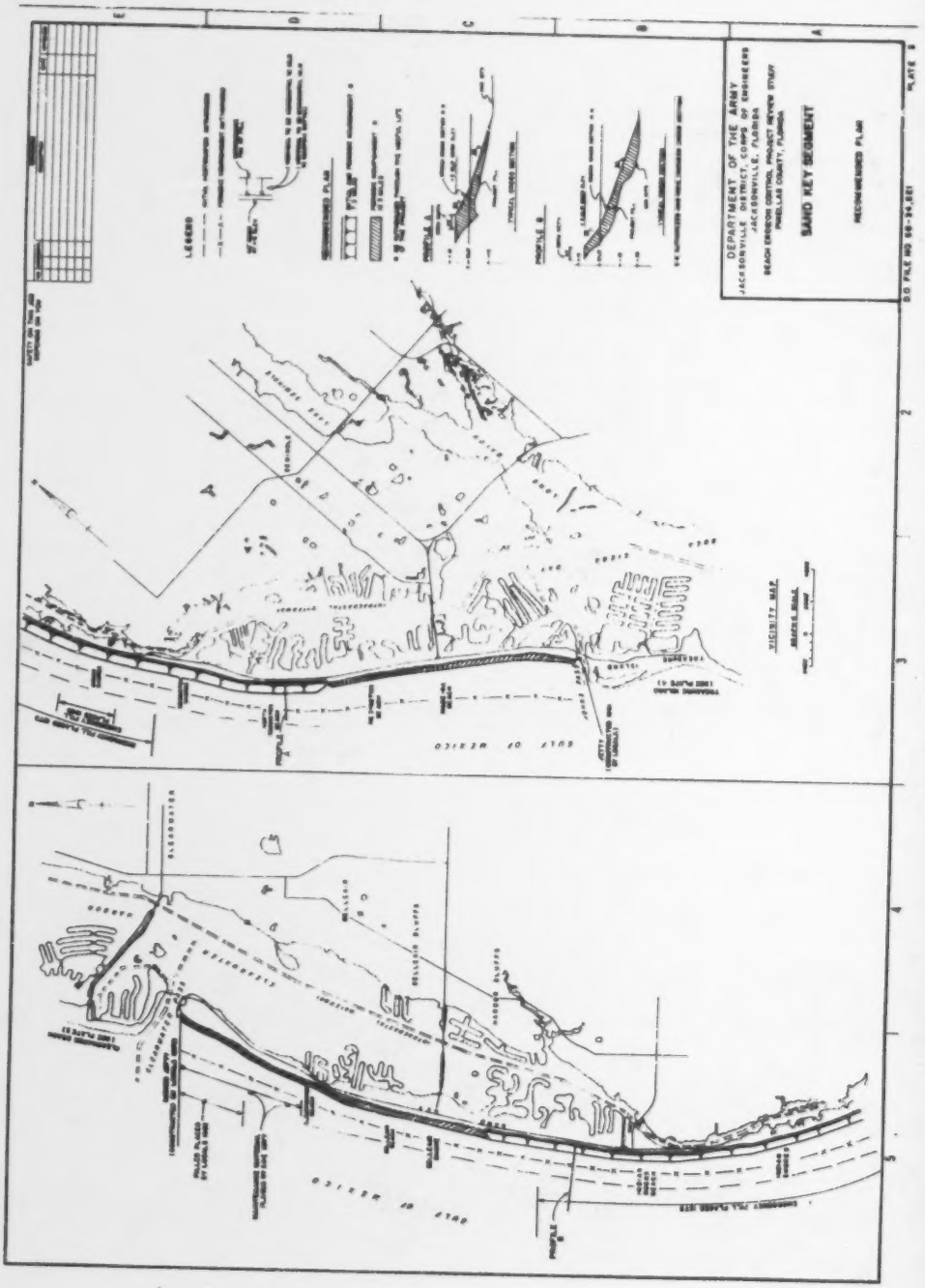
This project is co-sponsored by Palm Beach County and the City of Boca Raton. Boca Raton is located in southern Palm Beach County between Palm Beach and Miami. The northern two miles of the Boca Raton City Beach have lost approximately 1,324,000 cubic yards of sand. This loss has reduced the natural storm protection provided by the beach, thus subjecting inland structures to possible damage by storm surge. Available beach recreational area has also been reduced.

This proposal is to nourish 1.7 miles of beach with approximately 900,000 cubic yards of sand to restore storm protection and recreational area. This project is consistent with the overall Palm Beach County beach restoration program. This application is for reimbursement of $2,365,785. The project sponsors must obtain Corps approval of the project's plans and specifications before reimbursement can be authorized.

Project Justification

The project would provide storm protection for upland properties including State Road AlA and city park structures. The majority of the beachfront property is city owned. Therefore, the additional beach area would provide recreational space for residents and tourists.

Beach restoration projects in Palm Beach County have sometimes caused problems because of the presence of nearshore coral reefs that could be damaged by dredging and the resultant turbidity. This project has been particularly controversial. Only if all permitting issues are resolved should any appropriated funds actually be spent.


DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA
BEACH EROSION CONTROL PROJECT REVIEW STUDY
PINELLAS COUNTY, FLORIDA
SAND KEY SEGMENT
RECOMMENDED PLAN
LEGEND
GULF OF MEXICO

916

Pinellas County
(Construction)

Estimated Federal Cost	$19,100,000
Estimated Non-Federal Cost	20,762,000
Federal Funds Through FY 86	4,163,000
Non-Federal Funds Through FY 86	3,699,000
President's Budget	1,600,000
State of Florida Request FY 87	12,194,400
Benefit Cost Ratio: 3.3 to 1	

Project History/Description

Congress authorized a review of the beach erosion control report on Pinellas County, Florida in 1976. The resolution authorized a periodic nourishment project for five barrier islands: Mullet Key, Long Key, Treasure Island, Sand Key and Clearwater Beach Island. To date, funding has been used for breakwater construction and nourishment projects at Redington Shores and Long Key and reconstruction of a groin at Madeira Beach.

The Restoration sponsored by Pinellas County is for the placement of roughly 1.5 million cubic yards of sand on the beaches of Redington Beach, North Redington Shores and Indian Shores. Nourishment will consist of almost seven miles of shoreline. Although submitted as a separate proposal the Pinellas County Beaches project also includes nourishment of 2.8 miles along Indian Rocks Beach and the creation of an offshore breakwater.

Project Justification

Severe to moderate erosion has occurred in the towns of North Redington Beach, Redington Shores, Indian Shores, and Indian Rocks Beach. The beach nourishment will provide storm protection for public and private properties as well as Gulf Boulevard, a major roadway. The creation of a recreational beach will benefit residents and visitors to the Gulf Beaches of Pinellas County.

SOUTHERN LIMIT OF PERIODIC NOURISHMENT
COASTAL ZONE MANAGEMENT SYSTEM PARCEL
SOUTHERN LIMIT OF INITIAL FILL
VENICE
NOKOMIS BEACH
PLATE 3

918

Sarasota County Beaches
(Venice/Caspersen Beach)
(Continued Planning and Engineering)

Estimated Federal Cost	$479,000
Estimated Non-Federal Cost	486,000
Federal Funds Through FY 86	0
Non-Federal Funds Through FY 86	0
President's Budget	0
State of Florida Request FY 87	479,000
Benefit Cost Ratio: 2.1 to 1.0	

Project History/Description

Venice/Caspersen Beach is in Sarasota County on the west-central coast of Florida, about 50 miles southwest of Tampa. The county coastline consists of five barrier islands separated by tidal inlets.

In 1964, Congress authorized a study of beach erosion problems in Sarasota County. At the county's request, the study was deferred in 1970 but resumed in 1978. In April of 1984, the Corps of Engineers released the project's Feasibility Report and Environmental Impact Statement. The report indicates a favorable benefit/cost ratio, especially for Venice/Caspersen Beach. Erosion problems are particularly severe in that area. The most likely source of sand for the project is offshore.

For FY 87, the local sponsor is requesting $680,000 in preconstruction planning funds for renourishment of Venice/Caspersen Beach.

Project Justification

Local governments and private property owners have been renourishing beaches and building beach erosion control structures in Sarasota County for much of this century. In spite of these efforts, some of the County's beaches have eroded by more than 200 feet in the last 100 years. Sarasota County is experiencing explosive population growth, and adequate beach recreation could be provided for this population and for the ever-increasing number of tourists who visit the area. In addition, the destruction of abutting property improvements (including residences, multi-family developments, public roadways, and utility facilities) could be prevented. The Sarasota County Beaches Project would help meet these goals.

There are possible permitting difficulties due to increased turbidity, destruction of nearshore reefs interference with sea turtle nesting during nesting season, and similar environmental damage.

Environmental Restoration
and Enhancement
41. Ballard Park Boat Ramps
42. Banana Lake Restoration
43. Biscayne Bay Survey Review
44. Jacksonville Metropolitan Park
45. Six Mile Cypress
44
41
42
45
43

920

ENVIRONMENTAL RESTORATION AND ENHANCEMENT

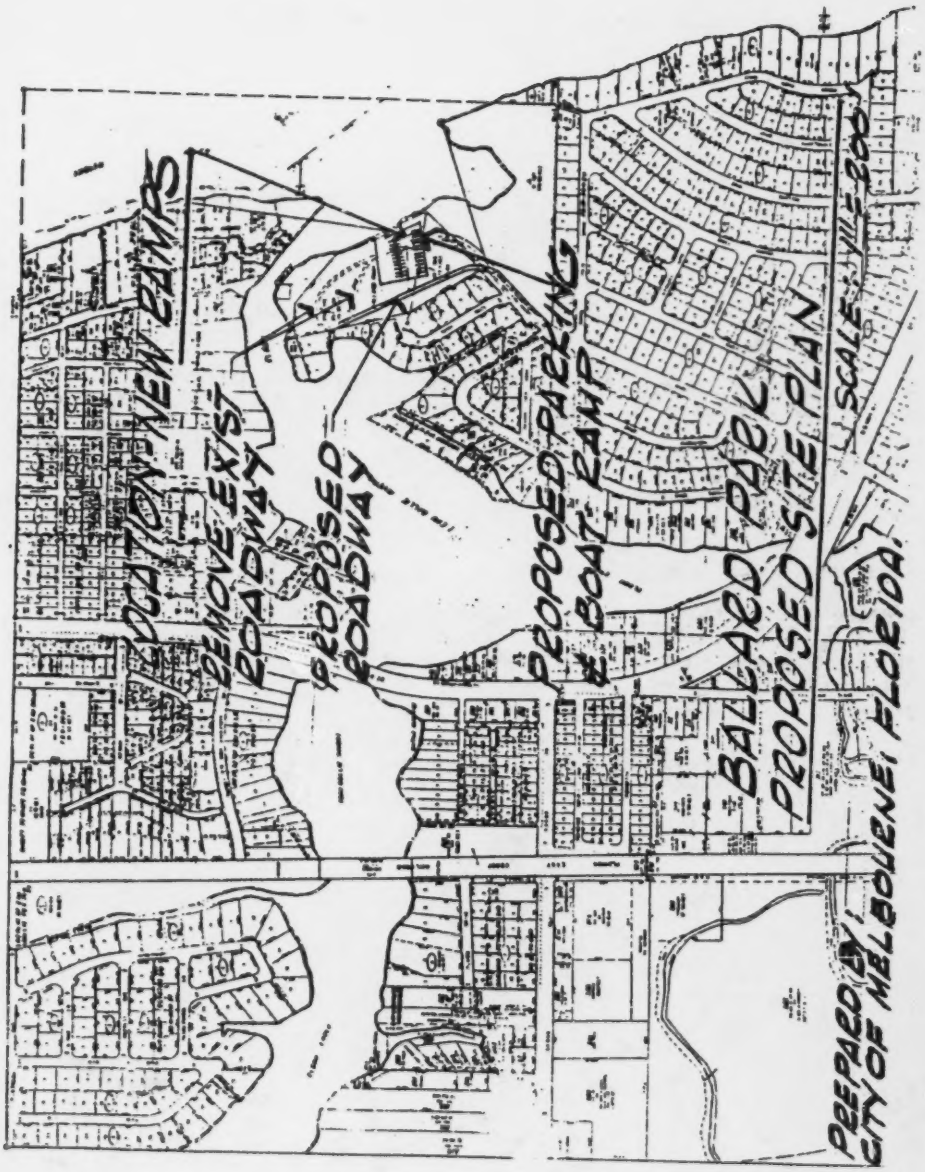
Ballard Park Boat Ramps and Accessibility Improvements

Banana Lake Restoration Feasibility

Biscayne Bay Survey Review

Jacksonville Metropolitan Park

Six Mile Cypress


PROPOSED SITE PLAN
BALLARD DOCK
PROPOSED PARKING
& BOAT RAMP
PROPOSED
ROADWAY
EXISTING
ROADWAY
NEW RAMPS
PREPARED BY
CITY OF MELBOURNE FLORIDA

Ballard Park Boat Ramps and Accessibility Improvements
(Project)

Estimated Federal Cost	$500,000
Estimated Non-Federal Cost	0
Federal Funds Through FY 86	0
Non-Federal Funds Through FY 86	0
President's Budget	0
State of Florida Request FY 87	500,000

Project History/Description

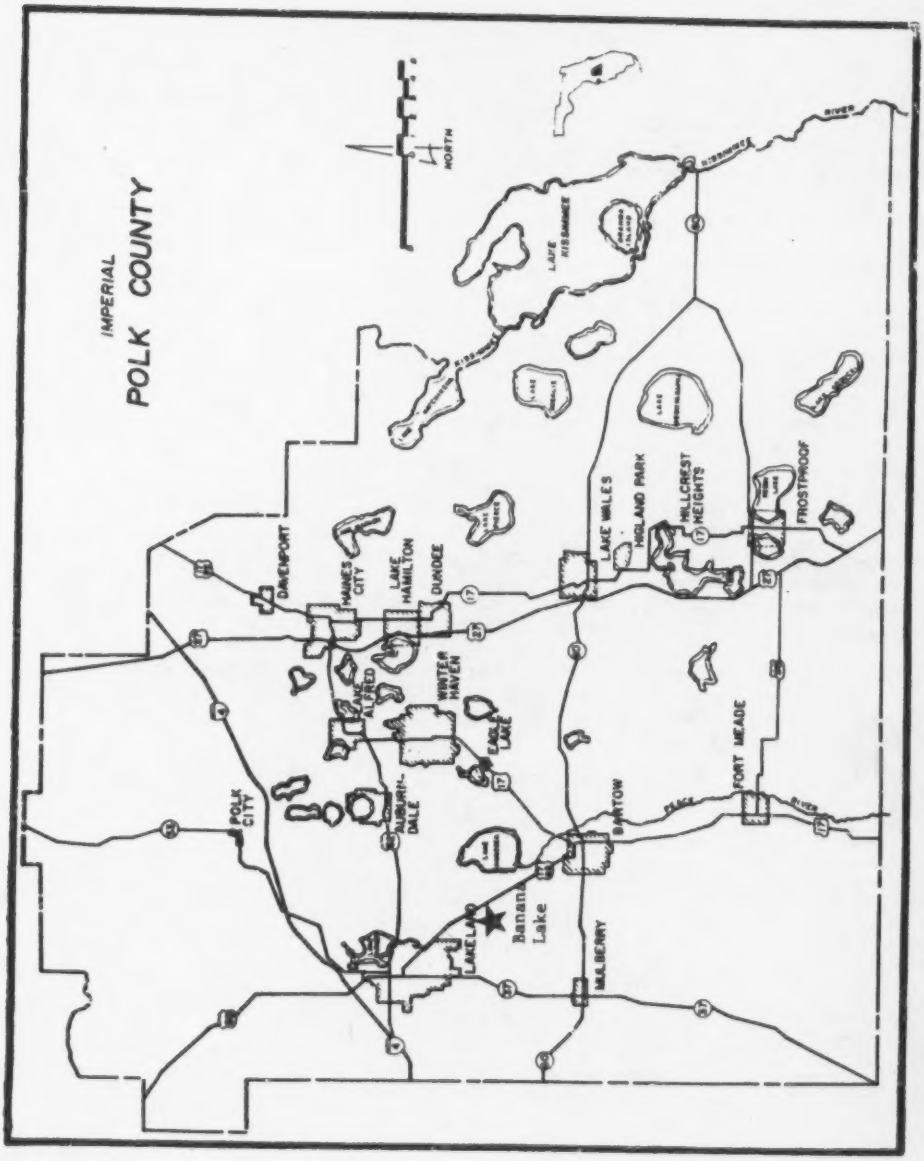
This is a new request by the City of Melbourne for $500,000 that, if authorized, would be implemented under the Corps' Code 710 Recreation Program, which is administered within the discretion of the Chief of Engineers.

The existing boat ramps at Ballard Park provide small boat access directly into the Eau Gallie River at a narrow portion of a turning basin. This creates a hazardous condition due to numerous large yachts using this same area. This Primarily, the proposal is to relocate the boat ramps to provide direct access to the Indian River in order to eliminate this hazardous condition and to improve the park's facilities.

The Corps has advised the sponsor that current administrative policies do not allow funding for Code 710 projects.

Project Justification

The project would eliminate the hazard that exists due to the location of the existing boat ramps which results in congested boat traffic and it would provide enhancement of the recreational facilities.


IMPERIAL
POLK COUNTY
NORTH
LAKE HISSARNEE
HISSARNEE
DAVENPORT
HAINES CITY
LAKE HAMILTON
DUNDEE
LAKE WALES
HIGHLAND PARK
HILLCREST HEIGHTS
FROSTPROOF
LAKE ALFRED
WINTER HAVEN
EAGLE LAKE
POLK CITY
AUBURNDALE
LAKELAND
Banana Lake
BARTOW
FORT MEADE
MULBERRY
PEACE
RIVER

Banana Lake Restoration Feasibility
(Study)

Estimated Federal Cost	To Be Determined
Estimated Non-Federal Cost	To Be Determined
Federal Funds Through FY 86	0
Non-Federal Funds Through FY 86	0
President's Budget	0
State of Florida Request FY 87	$100,000

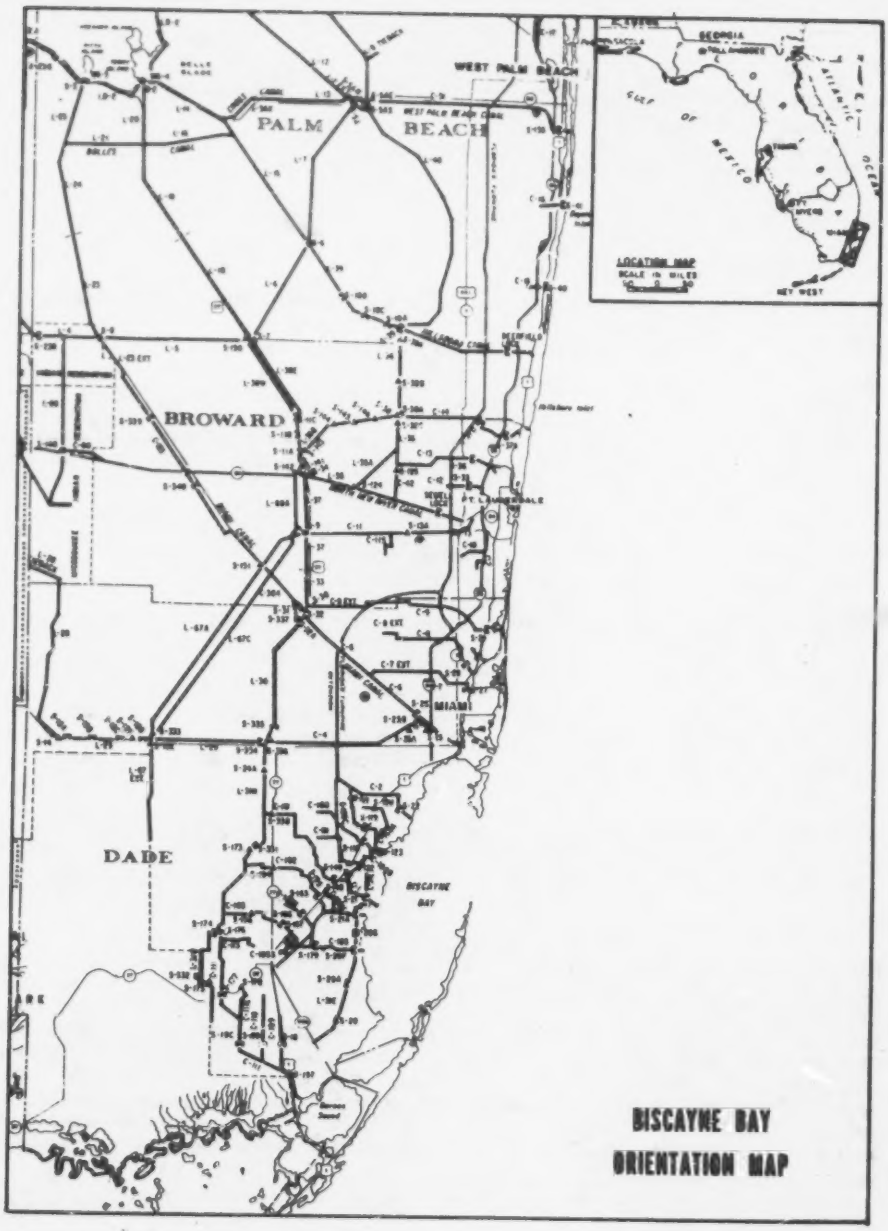
Project History/Description

Polk County proposed a new feasibility study to identify means of restoring Banana Lake, a 343-acre lake located southeast of the City of Lakeland in Polk County, Florida. The lake is hypereutrophic due largely to the receipt of treated effluent from Lakeland's 10 MGD sewage treatment plant. Although the elimination of discharge by October 1986 will result in improved water quality, the project sponsor feels additional restoration measures are necessary. An option proposed for study is to draw down the lake, consolidate and remove bottom sediments, and revegetate with beneficial aquatic plants.

Project Justification

Banana Lake is in a rapidly developing area close to a large population center (Lakeland). Although it is the only lake with public access in the immediate area, the lake is not used for recreational purposes since it lacks sport fisheries and has poor water quality and odors associated with it.

Additionally, restoration of the lake would benefit the downstream waters of Lake Hancock, which is also highly eutrophic, and the Peace River, which supplies water for DeSoto and Charlotte County communities. Study authorization will be needed.



BISCAYNE BAY
ORIENTATION MAP

Biscayne Bay Survey Review
(Study)

Estimated Federal Cost	$1,660,000
Estimated Non-Federal Cost	0
Federal Funds Through FY 86	240,000
Non-Federal Funds Through FY 86	0
President's Budget	0
State of Florida Request FY 87	675,000

Project History/Description

This study is a comprehensive review of environmental impacts from federally-authorized and constructed projects in and adjacent to Biscayne Bay in Dade County, Florida. The Corps of Engineers, acting as the lead federal agency in cooperation with the Federal Department of Transportation, is reviewing such projects as the Intracoastal Waterway (ICW), Government Cut, Bakers Haulover Inlet, the Central and Southern Florida Flood Control Project, and causeway construction to determine whether these and other federally-authorized projects are having a detrimental impact upon Biscayne Bay Funds initially allocated to the U.S. Army Corps of Engineers were used for a reconnaissance survey, which recommended five areas for further study:

1. Snake Creek freshwater discharge,
2. Sediment transfer through Haulover Inlet,
3. Mowry Canal freshwater discharge,
4. Miami River and canal freshwater discharge and sediment transport into the bay, and
5. Spoil island and shoal impacts on turbidity.

FY 84 funds were used to study the impact of Mowry Canal, Black Creek, and Snake Creek canal discharges by analyzing heavy metals and synthetic organic compounds. Similar monitoring in other portions of Biscayne Bay is being done with FY 85 funds.

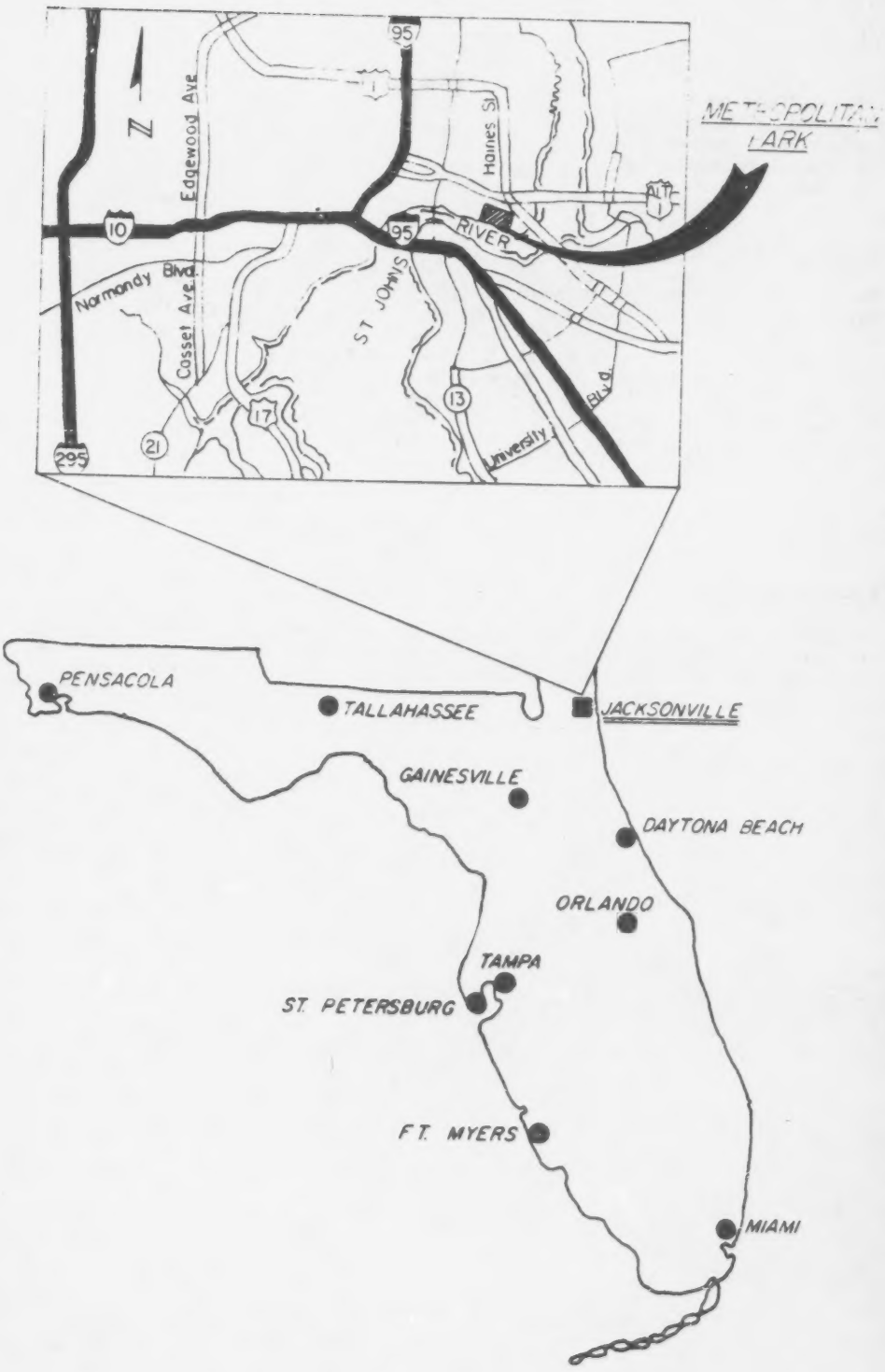
Congress authorized this study in 1980, appropriated $100,000 to begin it in FY 82 and has irregularly funded it since ($240,000 total). The FY 87 funding request for $675,000 will be needed to continue this study.

Project Justification

Biscayne Bay and the adjacent shoreline have been subjected to intense development and alternations from Federally authorized construction projects. The cumulative impacts of these projects on Biscayne Bay are not known. However, state and locally-funded studies have determined that water quality in the bay is poor, especially north of Rickenbacker Causeway. Excessive turbidity and reduced flushing are major problems. The information being generated by this study is needed for the development of guidelines for the future management of bay resources. A successful project will result in improved environmental quality of Biscayne Bay and enhancement of recreational opportunities.

Recommendation

Funding is recommended.


N
Edgewood Ave
Haines St
95
1
ALT 1
10
95
RIVER
Normandy Blvd
Cassat Ave
ST JOHNS
13
17
21
295
University Blvd
METROPOLITAN PARK
PENSACOLA
TALLAHASSEE
JACKSONVILLE
GAINESVILLE
DAYTONA BEACH
ORLANDO
TAMPA
ST. PETERSBURG
FT. MYERS
MIAMI

Jacksonville Metropolitan Park
(Study)

Estimated Federal Cost	To Be Determined
Estimated Non-Federal Cost	$150,000
Federal Funds Through FY 86	0
Non-Federal Funds Through FY 86	0
President's Budget	0
State of Florida Request FY 87	100,000

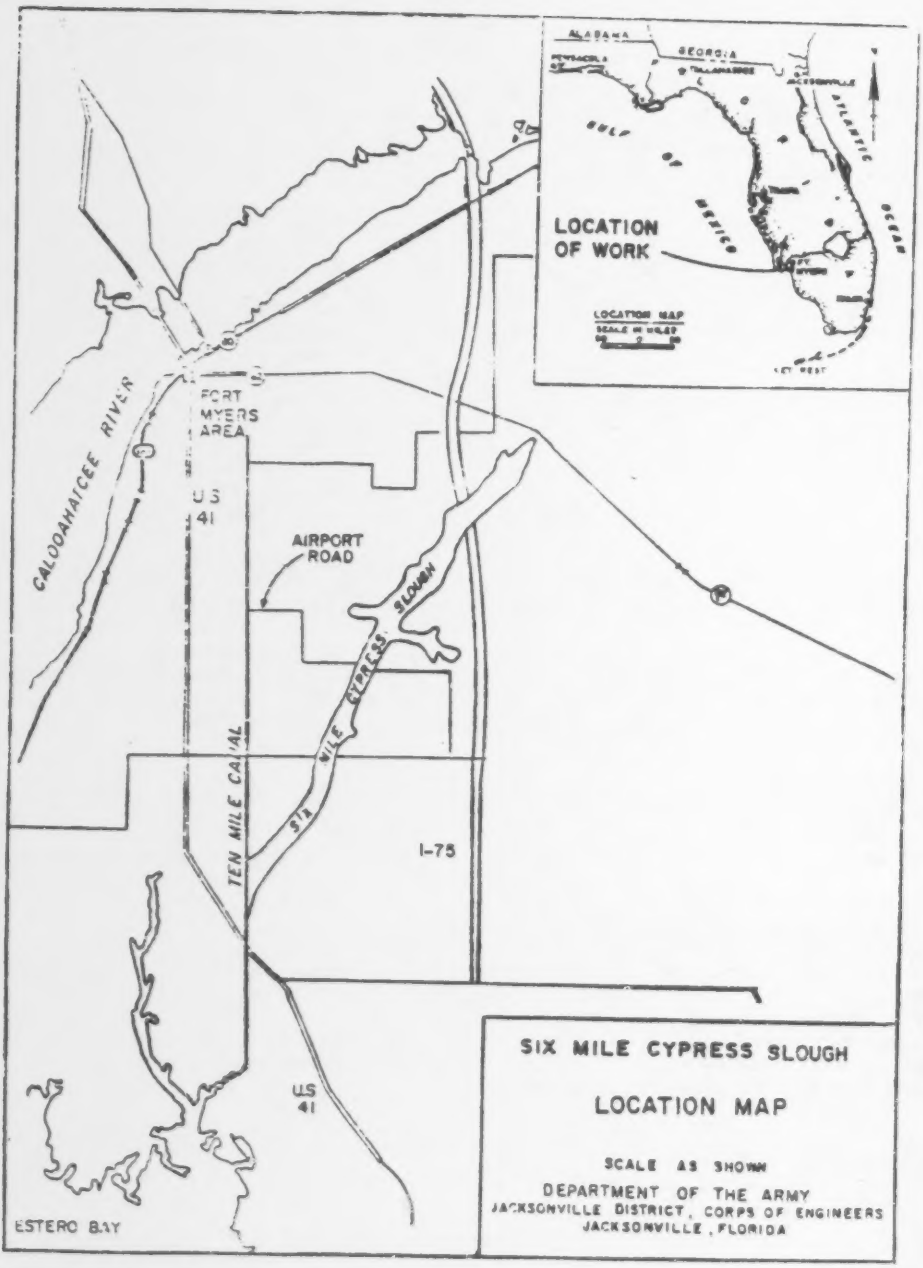
Project History/Description

The City of Jacksonville is requesting funding for a feasibility study under the Corps of Engineers' Code 710 recreational development program for an urban park located on the St. Johns River, approximately 2 miles from downtown Jacksonville. There is a high demand for outdoor recreation facilities in this area and existing facilities do not meet current needs. The 2005 Comprehensive Plan for the City of Jacksonville and some other studies have recommended a metropolitan recreational center in this area. Metropolitan Park is centrally located, has easy access to the river, and would be an ideal location for a marina and boat ramps. The FY 87 funding request is for $100,000 to initiate the study.

The Code 710 Program remains under a moratorium. At this time, the proposed study can only be placed on a waiting list.

Project Justification

The 2005 Comprehensive Plan for Jacksonville and some other studies agree on the lack of adequate opportunities for outdoor recreation activities in this area. Metropolitan Park would increase recreation opportunities for residents and would attract visitors to the area.


ALABAMA
GEORGIA
GULF OF MEXICO
ATLANTIC OCEAN
LOCATION OF WORK
LOCATION MAP
CALOOSAHATCHEE RIVER
FORT MYERS AREA
U.S. 41
AIRPORT ROAD
SLOUGH
SIX MILE CYPRESS
TEN MILE CANAL
I-75
U.S. 41
ESTERO BAY
SIX MILE CYPRESS SLOUGH
LOCATION MAP
SCALE AS SHOWN
DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

930

Six Mile Cypress
(Continued Planning and Engineering)

Estimated Federal Cost	To Be Determined
Estimated Non-Federal Cost	"
Federal Funds Through FY 86	0
Non-Federal Funds Through FY 86	0
President's Budget	0
State of Florida Request FY 87	$100,000

Project History/Description

The purpose of this effort is the preservation and management of the Six Mile Cypress Strand by two means: 1) construction of water control structures to prevent overdrainage and 2) acquisition of environmentally sensitive land between Daniels Road and Ten Mile Canal. The Six Mile Cypress Strand is one of the last major relatively-undisturbed cypress areas in Lee County. The strand is located approximately three miles southeast of Fort Myers and runs from State Road 82 southwesterly for ten miles to its confluence with Ten Mile Canal. Over the past several years, development pressures have begun to encroach upon the strand. Overdrainage has occurred and exotic plants have begun to replace the native cypress. The Six Mile Cypress Strand forms a natural buffer between the Fort Myers urban area to the west and the regional airport to the east.

Lee County on its own initiative is purchasing a portion of the strand and desires federal financial assistance in purchasing areas between Daniels Road and Ten Mile Canal. Lee County has also constructed temporary structures at these two locations to slow the rate of overdrainage. The Corps of Engineers is conducting this ongoing feasibility study of possible Federal action in the project area. FY 87 funding will be needed to to begin preconstruction planning.

Project Justification

The Six Mile Cypress Project would protect a unique natural cypress strand from overdrainage and enhance new cypress tree growth in areas which have historically supported such vegetation. This strand of cypress would also provide a natural buffer between the Ft. Myers Regional Airport and the urbanized Fort Myers area.

The Lee County Department of Transportation has expressed concern over further delays in this project proposal. Development pressures adjacent to the Six Mile Cypress Strand could adversely affect the strand's capability to retain stormwater runoff and to recharge groundwater supplies. In addition, as developmental pressures occur, nearby land values increase and could affect the land acquisition phase of this project.

APPENDIX

Governor and Cabinet Resolutions on the Cross Florida Barge Canal

Florida House of Representatives and Florida Senate Memorial to Congress Requesting Deauthorization of the Cross Florida Barge Canal

RESOLUTION

WHEREAS, the Governor and Cabinet of Florida, sitting as Head of the Department of Natural Resources, on August 1, 1972, rescinded their previous policy supporting completion of the Cross Florida Barge Canal through the Oklawaha River Valley and on that date suspended their support of this project until such time as:

1. A new benefit-cost ratio study, which includes up-to-date interest rates and construction costs and re-evaluation of recreational benefits, is completed and demonstrates to the satisfaction of the State that this is a wise expenditure of taxpayers funds.

2. An environmental impact statement, as required by Section 102 of the National Environmental Policy Act, is completed and available to the State for final evaluation as to the environmental effects of the Canal.

WHEREAS, restudy documents were prepared and released by the U. S. Corps of Engineers in the summer of 1976 and did contain a draft environmental impact statement and a benefit/cost ratio study displaying up-to-date interest rates which were additionally updated in December 1976; and

WHEREAS, the Governor and Cabinet of Florida, sitting as the Head of the Department of Natural Resources, on December 16 and 17, 1976, did consider the restudy documents and take public testimony relative to the Cross Florida Barge Canal;

NOW THEREFORE BE IT RESOLVED THAT:

A. The Governor and Cabinet, sitting as the Head of the Department of Natural Resources, and recognizing the authority of the United States Congress to complete the canal, respectfully:

1. Recommend against completion of the Cross Florida Barge Canal Project.

2. Request the United States Congress to de-authorize the Cross Florida Barge Canal Project.

3. Recommend to the United States Congress that it authorize and appropriate sufficient funds for federal participation in and implementation of the following recommendations:

(a) Establishment of a State-Federal Task Force to study and recommend the best disposition and use of the canal lands with special emphasis on:

(1) Restoration of the Oklawaha River, its designation as a wild and scenic river, and its inclusion in the Ocala National Forest;

(2) Use of other remaining canal lands for public recreational and environmental purposes especially to meet the present and future needs of the canal-area counties; and

(b) Lands previously supplied by the State of Florida to the Federal Government and not necessary for use by the Federal Government for a wild and scenic river system or Ocala National Forest be returned to the State of Florida.

4. Direct the staff of the Department of Natural Resources to coordinate state efforts in an interagency State-Federal Task Force to study and recommend the best disposition and use of the canal lands with special emphasis on restoration of the Oklawaha River, its designation as a wild and scenic river, and its inclusion in the Ocala National Forest.

5. Direct the Division of State Planning of the Department of Administration to study and make specific recommendations for applications to be made by the State of Florida to the United States Congress for funding of sewage treatment construction projects in the State of Florida, for federal impact funds for economically depressed areas, as well as other federal funds which will have an impact on the State of Florida.

B. The Governor and Cabinet, sitting as the Head of the Department of Natural Resources, recommend to the 1977 Florida Legislature that:

1. The responsibilities of the Canal Authority be amended in order to retain public ownership of the lands associated with the project as necessary to accomplish "A" above.

2. Legislation be enacted which will permit appropriate title to be secured for those lands currently held in easement as necessary to accomplish "A" above.

3. Title to the lands associated with the project retained by or returned to an agency of the state be transferred to the Trustees of the Internal Improvement Trust Fund.

4. Chapter 374, Florida Statutes, Part II (Sections 374.301-374.521) be repealed and any funds remaining in the accounts of the Cross Florida Canal Navigation District and not legally obligated, be returned to the counties in the District on a prorata basis, established by the tax monies furnished to the District by these counties.

5. Section 20.25(12), Florida Statutes, be amended to read "The canal authority of the State of Florida, created under part I of Chapter 374, is transferred by a type three transfer to the Department of Natural Resources and the functions shall be assigned to the Division of Resource Management".

6. All such state lands determined not to be necessary for recreation, wildlife or environmental preservation be sold at public sale to the highest bidder and the funds derived be refunded to the counties involved on a prorata basis in the manner established by the tax monies furnished by these counties for the Cross Florida Canal Navigation District. The total monies refunded to the various counties are to be calculated by converting the actual amount furnished to its present dollar value giving the effect of interest charged at average market rates being compounded annually over the total period of financial commitment. Should the funds so derived be in excess, any surplus will be returned to the different counties on a prorata basis. Should the funds so derived be insufficient, the Governor and Cabinet, sitting

as Head of the Department of Natural Resources, recommend to the Florida Legislature that they appropriate sufficient funds to fulfill this obligation.

C. The Governor and Cabinet, sitting as Head of the Department of Natural Resources, direct the staff of the Department of Natural Resources, upon approval and implementation of "B.3", to prepare any additional legislative recommendations for use or disposition of resources and facilities of the project consistent with the above recommendations.

DONE AND EXECUTED at Tallahassee, Florida, this 17th day of January, 1977, A. D.

Governor

Secretary of State

Attorney General

Comptroller

Treasurer

Commissioner of Agriculture

Commissioner of Education

ATTEST:

Secretary

As and Constituting the Head of the State of Florida Department of Natural Resources.

State Of Florida

RESOLUTION

WHEREAS, the Governor and Cabinet, sitting as head of the Department of Natural Resources, on December 16 and 17, 1976, considered extensive testimony concerning the economic justification and environmental effects of the Cross Florida Barge Canal; and

WHEREAS, by resolution adopted January 17, 1977, the Governor and Cabinet recommended against completion of the Cross Florida Barge Canal Project and requested the United States Congress to deauthorize this Project; and

WHEREAS, the Florida Legislature in 1979 adopted Chapter 79-187, Laws of Florida, which provided for the orderly disposition of Canal lands and facilities upon deauthorization of the Cross Florida Barge Canal Project by the United States Congress; and

WHEREAS, Chapter 79-187, Laws of Florida, provides for refunds to counties contributing ad valorem tax dollars to the Cross Florida Barge Canal Project, plus interest from the date of such contributions, and interest assessments thereunder continue to accrue against Canal assets; and

WHEREAS, litigation has been filed seeking reversion of Canal lands to former landowners which in some instances has been successful; and

WHEREAS, S. 1131 and H.R. 3695 have been acted on the United States Congress and Congress has under consideration the deauthorization of the Cross Florida Barge Canal Project.

NOW THEREFORE BE IT RESOLVED THAT:

The Governor and Cabinet of the State of Florida, recognizing the authority of the United States Congress to require completion of the Canal, respectfully:

1. Recommend against completion of the Cross Florida Barge Canal Project.

2. Request the United States Congress to deauthorize the Cross Florida Barge Canal Project.

3. Recommend the United States Congress appropriate sufficient funds to purchase Canal lands located in the Ocklawaha River Valley and included in the extended boundary of the Ocala National Forest as specified in Section 253.781, Florida Statutes.

DONE AND EXECUTED at Tallahassee, Florida, this the 3d day of August, 1933, A.D.

Bob Graham
Governor

George Firestone
Secretary of State

Jim Smith
Attorney General

Gerald Lewis
Comptroller

Bill Gunter
Treasurer

Doyle Conner
Commissioner of Agriculture

Ralph D. Turlington
Commissioner of Education

House Memorial No. 378

A memorial to the Congress of the United States, urging Congress to take whatever action is necessary to provide for the deauthorization of the Cross Florida Barge Canal Project.

WHEREAS, the Legislature of the State of Florida took every available step in 1979 to repeal the Cross Florida Barge Canal Project through the adoption of chapter 79-167, Laws of Florida, and

WHEREAS, any further legislation or action providing for the deauthorization of the Cross Florida Barge Canal requires action by the Congress of the United States, and

WHEREAS, the Legislature of the State of Florida has determined that the Cross Florida Barge Canal Project would have a deleterious effect upon the ecology of the state, would adversely affect the freshwater aquifers of the state, and that the positive benefits of the project would be outweighed by its negative effect on the state's environment, and

WHEREAS, the Legislature of the State of Florida has demonstrated its ongoing dedication to the preservation of the environment by passing legislation to preserve its wetlands

and legislation aimed at protecting the state's freshwater aquifers, and

WHEREAS, it is fitting and appropriate that the Legislature of the State of Florida urge the Congress of the United States to take whatever action is appropriate to provide for the deauthorization of the Cross Florida Barge Canal Project, NOW, THEREFORE,

Be It Resolved by the Legislature of the State of Florida:

That the Congress of the United States is requested to take whatever action is necessary to provide for the deauthorization of the Cross Florida Barge Canal Project.

BE IT FURTHER RESOLVED that copies of this memorial be dispatched to the President of the United States, to the President of the United States Senate, to the Speaker of the United States House of Representatives, and to each member of the Florida delegation to the United States Congress.

Filed in Office Secretary of State May 16, 1985.

Mr. BENNETT. The last witness from Florida will be Mr. Fuqua, and I think I already named the other people who have testimony.

Mr. WATKINS. Thank you, Mr. Bennett, very much. You always do a great job.

The distinguished chairman of the Science and Technology Committee, and a friend we hate to see leaving, Don Fuqua.

Mr. FUQUA. Thank you, Chairman Watkins.

I remember when you served on our committee and Mr. Rudd and the others who have served on the committee, but let me talk about something for the home folks first. I support what Secretary Tschinkel has stated, primarily the Suwannee River mapping project, which is in my district and also the one relating to the St. Marys River floodplain regional water supply.

Let me talk just a moment about a small Section 107 project. This is the one at Shell Point. Wakulla County is one of those unique counties that is nearest to Tallahassee, a large metropolitan area. About 35 miles away from the county, it is about two-thirds owned by the Federal Government. Apalachicola National Forest makes up a big portion of the county and the remainder is St. Marys National Wildlife Refuge in which no timber-cutting can be made, and so forth. And there is a tremendous amount of boating that goes on out of Shell Point. They have come up with formula whereby the county provides half of the funds, and that little county doesn't have the tax base to generate that. I am one who advocates waiving those, because there are special cases.

Mr. WATKINS. I want you to know, Mr. Chairman, being from rural southeast Oklahoma, I understand what you are saying.

Mr. FUQUA. I knew you would.

I would hope that the committee could look favorably on some type of waiver for the local effort. They can provide spoil area and things of that type. But, as far as coming up with tax money, they do not have it because there is no tax base in the county.

It is very seriously needed for recreation, both boating and commercial. This is not a chicken-or-egg situation; it is not commercial because the channel is not deep enough right now, and if we get the channel deep enough you will have commercial boats coming and going and I would appreciate your consideration of that. Otherwise, my Statement conforms with what has been presented to you by Ms. Tschinkel.

If I could switch hats now and talk about the Committee on Science and Technology and the subcommittee that I chair relating to the DOE R&D program for fiscal year 1987 and Solar Energy, Geothermal Energy, Supporting Research and Technical Analysis, General Science and Research, and the Geothermal Resources Development Fund adopted by the Subcommittee on Energy Development and Applications on March 19, 1986.

The Department submitted a fiscal year 1987 budget request to Congress for the Solar Energy and Geothermal Energy R&D programs at funding levels that are over 47 percent below the fiscal year 1986 appropriations. We continue to believe that renewable energy has an important role to play in our nation's overall energy mix, and that a healthy R&D effort must be sustained.

However, adhering to the need for fiscal stringency, our recommended increases bring the fiscal year 1987 funding for these pro-

grams to approximately 15 percent below the current year level. Overall, we recommend a Solar Energy appropriation of $121.9 million and a Geothermal Energy appropriation of $23.2 million.

The Subcommittee supports the Department's request of $72,000 for the Geothermal Resources Development Fund.

In basic research, the Department requested increases of 5.9 percent and 16.9 percent above the fiscal year 1986 appropriations for Supporting Research and Technical Analysis, and General Science and Research, respectively. We support the timely completion and operation of the Department's basic research facilities currently under construction, and the department's initiatives in new materials facilities and supercomputers, and recommend them highly, along with the new Continuous Electron Beam Accelerator Facility and Relativistic Heavy Ion Collider initiatives in the nuclear physics program.

Regrettably, however, the Subcommittee is unable to sustain the increases in basic research requested by the department in fiscal year 1987. Last month, just prior to the Subcommittee's markup, the Budget Committee advised the Committee on Science and Technology that a reduction of $100 million of obligations in the energy and sciences programs from current year levels was necessary.

The share of the $100 million for the Subcommittee on Energy Development and Applications is $63.4 million, requiring that we reduce funding for all Subcommittee programs below current funding levels, including the basic research programs. Consequently, the Subcommittee recommended general reductions of $66.3 million to the Department's request for Supporting Research and Technical Analysis, and $131.7 million to the Department's request for General Science and Research so that the fiscal year 1987 budgets for these programs would be approximately 4.2 percent below the fiscal year 1986 appropriations.

I would like to make this additional comment. I have described to you the action of our Subcommittee only. I have chosen not to bring this before the full Science and Technology Committee as yet. I certainly intend to watch matters develop.

As we get a budget resolution, we may be able to adjust the figures accordingly.

The Subcommittee took this action in the spirit of budget reduction with no increase in revenue. It is not clear that all authorizing committees are similarly committed. Even within our own Committee, some subcommittee's have not exercised similar restraint, and as yet we are not marking up their recommendations either.

The cuts that our Subcommittees have imposed on basic research I believe to be debilitating if not dangerous. It remains my hope that some mechanism can be found for avoiding the Draconian cuts on research activities which are the nation's hope for the future.

In closing to what is my last appearance as a Member before this Subcommittee, I would like to express my appreciation for the spirit of cooperation that has existed between my committee and the Appropriations Committee during my tenure in Congress, both the Members as well as the staff. I believe that this relationship is important to the advancement of American science and technology, and I hope that it will continue in future Congresses. I want to thank you for this opportunity to testify.

[The statement of Mr. Fuqua follows:]

STATEMENT BY THE HONORABLE DON FUQUA BEFORE THE SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

Mr. Chairman, I appreciate this annual opportunity to appear before your subcommittee on behalf of flood damage prevention, navigation projects and environmental restoration in the state of Florida. I have examined the material submitted by the Florida Department of Environmental Regulation and want to endorse its proposals. I also want to take this opportunity to outline those projects of special importance to the Second Congressional District.

The Section 107 small navigation projects are of vital concern to the Second District which contains a long coastline. These projects make navigation possible for commercial and recreational purposes and many small communities could not survive if we terminate these programs.

Of paramount concern is the Shell Point project in Wakulla County. The Corps, in response to a directive from this subcommittee, has conducted studies and is ready to begin work on the project. Unfortunately, Wakulla County is simply unable to provide the funds necessary for matching the federal contribution as determined by the Corps. I believe this project is extremely meritorious and would urge the subcommittee to fund the entire project for the coming fiscal year. I pledge to work with you in this endeavor.

Every few years the Suwannee River floods its banks. Due to hurricanes, 1985 was such a year. The Suwannee River is one of our nation's last unspoiled river resources and this flood plain mapping project, as outlined in the material submitted by the State of Florida, is urgently needed.

I would also bring to your attention the St. Mary's River Basin Flood Plain study and the Withlacoochee River Regional Water Supply study which both impact on the Second Congressional District.

Obviously, as we all know, the Gramm-Rudman restrictions make your job more difficult than ever before. Some projects throughout the nation may be delayed or construction spread out over several years. I appreciate your attention and want to do all I can to help reduce our deficit and still meet our water resource needs.

STATEMENT OF THE
HONORABLE DON FUQUA (D-FL)
before the
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT
COMMITTEE ON APPROPRIATIONS
U.S. HOUSE OF REPRESENTATIVES

April 10, 1986

Mr. Chairman and Members of the Subcommittee, I am pleased to appear before you today to present recommendations for the Department of Energy (DOE) R&D programs for fiscal year 1987 in Solar Energy, Geothermal Energy, Supporting Research and Technical Analysis, General Science and Research, and the Geothermal Resources Development Fund adopted by the Subcommittee on Energy Development and Applications on March 19, 1986.

The Department submitted a fiscal year 1987 budget request to Congress for the Solar Energy and Geothermal Energy R&D programs at funding levels that are over 47 percent below the fiscal year 1986 appropriations. We continue to believe that renewable energy has an important role to play in our Nation's overall energy mix, and that a healthy R&D effort must be sustained. However, adhering to the need for fiscal stringency, our recommended increases bring the fiscal year 1987 funding for these programs to approximately 15 percent below the current year level.

In basic research, the Department requested increases of 5.9 percent and 16.9 percent above the fiscal year 1986 appropriations for Supporting Research and Technical Analysis, and General Science and Research, respectively. We support the timely completion and operation of the Department's basic research facilities currently under construction, and the Department's initiatives in new materials facilities and supercomputers, and recommend them highly, along with the new Continuous Electron Beam Accelerator Facility and Relativistic Heavy Ion Collider initiatives in the Nuclear Physics program.

Regrettably, however, the Subcommittee is unable to sustain the increases in basic research requested by the Department in fiscal year 1987. Last month, just prior to the Subcommittee's markup, the Budget Committee advised the Committee on Science and Technology that a reduction of $100,000,000 of obligations in the energy and sciences programs from current year levels was necessary. The share of the $100,000,000 for the Subcommittee on Energy Development and Applications is $63,400,000, requiring that we reduce funding for all Subcommittee programs below current funding levels, including the basic research programs. Consequently, the Subcommittee recommended general reductions of $66,303,000 to the Department's request for Supporting Research and Technical Analysis, and $131,729,000 to the Department's request for General Science and Research so that the fiscal year 1987 budgets for these programs would be approximately 4.2 percent below the fiscal year 1986 appropriations.

Now, I would like to summarize the Subcommittee's recommendations.

SOLAR ENERGY: $121,902,000

In Solar Energy, the Subcommittee recommends an appropriation of $121,902,000, which is $49,610,000 above the DOE's fiscal year 1987 request and $22,722,000 below the fiscal year 1986 appropriation. Details of these changes appear below.

Solar Buildings Energy Systems: $6,950,000

The Subcommittee's recommendations for Solar Buildings Energy Systems add $2,250,000 to the Department's request for a total appropriation of $6,950,000 to provide: (1) $3,600,000 for Materials and Components Research; and (2) $3,350,000 for Systems Research and Development, including $1,300,000 for aperatures-related R&D and $650,000 for transfer of solar buildings energy technology to industry.

Photovoltaic Energy Systems: $38,000,000

The Subcommittee's recommendations for Photovoltaic Energy Systems add $17,400,000 to the Department's request for a total appropriation of $38,000,000 to provide: (1) $31,000,000 for Materials Research, including $16,000,000 for Single Junction Films, $9,000,000 for High Efficiency Multijunction Concepts, and $6,000,000 for Innovative Concepts; (2) $4,000,000 for Collector Research for Concentrator Collectors; (3) $1,000,000 for Systems Research for Module Reliability; and (4) $2,000,000 to provide necessary new and replacement research equipment to guarantee state-of-the-art capabilities for the Solar Energy Research Institute, university and small business participants in the Photovoltaic program which are required in this technical research area.

Solar Thermal Energy Systems: $22,000,000

The Subcommittee's recommendations for Solar Thermal Energy Systems add $8,700,000 to the Department's request for a total appropriation of $22,000,000 to provide: (1) $10,150,000 for Collection Technology Research; (2) $4,350,000 for Energy Conversion Technology Research; (3) $7,250,000 for Systems Technology Research; and (4) $250,000 for Planning and Assessment.

Within the $10,150,000 provided for Collection Technology Research, $890,000 is designated for solar bowl studies, with the proviso that these funds designated for solar bowl studies not available for obligation until all of the following conditions are met: the current Crosbyton Solar Power Project work contract is completed; the final report of work is completed and released to the Department of Energy; and the evaluation of the solar bowl technology relative to the other solar thermal technologies is complete. Upon review of the evaluation, the Department is to make a determination on the obligation of the funds.

Biofuels Energy Systems: $24,100,000

The Subcommittee's recommendations for Biofuels Energy Systems add $11,900,000 to the Department's request for a total appropriation of $24,100,000 to provide: (1) $5,200,000 for Production Research, including $2,500,000 for Short Rotation

Intensive Culture, $1,400,000 for Herbaceous Energy Crops, and $1,300,000 for Aquatic Species; (2) $9,200,000 for Thermochemical Conversion; (3) $7,100,000 for Biochemical Conversion, including $1,350,000 for 50/50 funding with the Gas Research Institute to biologically convert organic matter to methane at an existing experimental test unit at Walt Disney World, Orlando, Florida, to complete the project's funding requirements; and (4) $2,000,000 for Advanced Concepts to initiate a joint Department of Energy laboratory-university program to investigate light-conversion processes, other than photovoltaics, that could lead to the direct production of useful fuels or chemicals.

Wind Energy Systems: $17,000,000

The Subcommittee's recommendations for Wind Energy Systems add $8,750,000 to the Department's request for a total appropriation of $17,000,000 to provide: (1) $7,580,000 for Basic Science of Wind Turbine Dynamics, an increase of $2,000,000 to the Department's request, for increased efforts on Atmospheric Fluid Dynamics and Aerodynamics Research to be carried out primarily in universities; (2) $4,750,000 for Advanced Components and Supporting Research, an increase of $2,250,000 to the Department's request for enhancement of the Cooperative Field Test Program and for Wind/Diesel and Remote Power Systems Research; and (3) $4,500,000 for the MOD 5-B.

With regard to the MOD 5-B, $4,500,000 is provided to test the unit because a large percentage of the funding for fabrication, installation, and testing of the unit has already been appropriated and spent, and the project should be completed. However, the Subcommittee recommends that no additional funds be expended on the machine, beyond those for testing, in the event of mechanical failure.

Ocean Energy Systems: $4,200,000

The Subcommittee's recommendations for Ocean Energy Systems add $1,700,000 to the Department's request for a total appropriation of $4,200,000 to provide: (1) $200,000 for Materials and Structures Research to develop and evaluate cold water pipe effects; (2) $1,500,000 for Thermodynamic Research and Analysis to increase efforts to validate open cycle analytical models, evaluate mist lift, wave and latent concepts, and complete a conceptual design for a 165 kilowatt-electric open cycle plant, at an estimated cost of $1,000,000; and (3) $2,500,000 for Experimental Verification and Testing to experimentally validate open-cycle Ocean Thermal Energy Conversion processes in seawater, and to conduct materials degradation experiments. The Subcommittee recommends that no fiscal year 1987 funds be used for purchase of the cold water pipe for the Sea Coast Test Facility upgrade.

Other Solar: $9,652,000

The Subcommittee recommends $9,652,000, an increase of $910,000 above the Department's request for the International Solar Energy Program, Solar Technology Transfer, Solar Energy Research Institute, Solar Program Support, Solar Resource Assessment, and Solar Program Direction.

GEOTHERMAL ENERGY: $25,200,000

The Subcommittee's fiscal year 1987 recommendations for Geothermal Energy add $5,250,000 to the Department's request to provide: (1) $3,000,000 for Geopressured Resources; (2) $19,400,000 for Geothermal Technology Development; and (3) $780,000 for Program Direction.

The Subcommittee recommends that the $19,400,000 designated for Geothermal Technology Development be allocated as follows: (1) $8,000,000 for Hot Dry Rock Research to complete the design, purchase, and construction of the surface system in order that the program may proceed to a logical conclusion; (2) $8,000,000 for Hydrothermal Research; (3) $2,400,000 for Hard Rock Penetration Research; and (4) $1,000,000 for Magma Energy Extraction Research.

SUPPORTING RESEARCH AND TECHNICAL ANALYSIS: $474,711,000

With the exception of the general reduction of $66,303,000 to be applied at the Department's discretion to assure that the funds not explicitly identified by the Subcommittee may be used for the remaining highest priority programs, the Subcommittee supports the Department's fiscal year 1987 request for Supporting Research and Technical Analysis, with two exceptions in the Basic Energy Sciences program. These are the following: (1) the Subcommittee recommends the addition of $5,000,000 to the Department's request for Chemical Sciences operating expenses to fund initiatives recommended in the National Research Council's 1985 report, Opportunities in Chemistry; and (2) the Subcommittee recommends the addition of $11,479,000 to the Department's request for Applied Mathematical Sciences operating expenses to fulfill the third year of the Department's five-year contractual agreement with the Supercomputer Computational Research Institute.

GENERAL SCIENCE AND RESEARCH: $633,671,000

With the exception of the general reduction of $131,729,000 to be applied at the Department's discretion to assure that the funds not explicitly identified by the Subcommittee may be used for the remaining highest priority programs, the Subcommittee supports the Department's fiscal year 1987 request for General Science and Research with one exception in the Nuclear Physics program: the Subcommittee recommends a decrease of $8,000,000 from the Department's request for Project 87-R-203, the Continuous Electron Beam Accelerator Facility, for a total project appropriation of $17,000,000.

In addition, it is the Subcommittee's understanding that the Secretary of Energy will decide during fiscal year 1986 whether or not to proceed with the construction of the SSC in fiscal year 1988 or fiscal year 1989. In the event that either the decision is made not to proceed with the construction of the SSC, or that there is no decision made during fiscal year 1986, the Subcommittee recommends that the Department cease all funding for the project in fiscal year 1987.

GEOTHERMAL RESOURCES DEVELOPMENT FUND: $72,000

The Subcommittee recommends $72,000 for the Geothermal Resources Development Fund which is the Department's request.

I would like to make this additional comment. I have described to you the action of our subcommittee only. I have chosen not to bring this before the full Science and Technology Committee as yet. I certainly intend to watch matters develop.

The subcommittee took this action in the spirit of budget reduction with no increase in revenue. It is not clear that all authorizing committees are similarly committed. Even within our own committee some subcommittees have not exercised similar restraint, and as yet we are not marking-up their recommendations either.

The cuts that our subcommittees have imposed on basic research I believe to be debilitating if not dangerous. It remains my hope that some mechanism can be found for avoiding the Draconian cuts on research activities which are the nation's hope for the future.

In closing to what is my last appearance as a Member before this Subcomittee, I would like to express my appreciation for the spirit of cooperation that has existed between my Committee and the Appropriations Committee during my tenure in Congress. I believe that this relationship is important to the advancement of American science and technology, and I hope that it will continue in future Congresses. Thank you for this opportunity to testify.

Mr. BEVILL. Thank you, Mr. Chairman. I had to step out and meet about 40 senior citizens from my district, and so I do have my priorities right.

Mr. FUQUA. Yes, sir.

Mr. BEVILL. We appreciate you so much, and so does certainly everyone in this Congress. I don't know of any Member of Congress more respected than you are, and the relationship with your committee and this committee couldn't be any better. We are going to miss you very much.

Mr. FUQUA. Thank you.

Mr. BEVILL. We appreciate the great job you have done not only for the State of Florida but for the whole country. You have been a great leader. We hope you won't forget us, and will come back to see us. I have an idea you will still be appearing before this committee. You have been appearing here even before I got here, so thank you for everything.

Mr. FUQUA. Thank you.

Mr. MYERS. I share the sentiment of our Chairman Bevill. It has been a pleasure working with you through the years. Our two committees necessarily have had to work very closely together, of course, but the spirit of cooperation that you have shown, and your willingness to work together certainly has been appreciated. We will miss you around this place, and it is not only a loss to the committee, but to the Congress, and certainly to Florida and the nation, as well.

But I share the hope of the chairman that you will be coming back wearing a different hat, not as a Member, of course but coming back and keeping us advised. We think you have been on the right track and we need your valuable input.

Mr. FUQUA. Thank you, John. It has been a pleasure. The committee and the staff have been very great to work with.

Mr. MYERS. I have one question. Wearing your hat as chairman of your committee, we have in the past designated certain universities to receive funds for research and even to be a research center. Does your committee have any objection if we continue to cite certain cases where the money should go to certain universities?

Mr. FUQUA. I think those that have been approved in the past, and I hope if there is any request for new ones, that we can certainly work together to make sure that we don't have an erosion of that practice.

Mr. MYERS. Some of the universities feel that they ought to decide among themselves where those funds go. I know we have discussed this in the past.

Mr. FUQUA. I have a bill in that I hope we can get passed, that puts a set-aside for some funds to be used for university construction and instrumentation. We haven't had a program in that field since the late '60s, and many of those buildings that were built at that time are now 20-plus years old, and others prior to that time are getting very old. We haven't kept up with the equipment modernization in our research facilities. We try to address that in this bill.

I hope that we can pass a bill of that type. Then it would alleviate the need to make special exceptions for universities as we have been called upon to do in the past. This will provide that. As it is

today, there is no provision for that, and pressure is building and there needs to be some relief to that very critical situation. We have had numerous hearings on that. There has been the National Academy of Sciences and others groups that have reviewed that.

I am not saying that the bill is perfect in every form, but I think it addresses in an overall comprehensive fashion that very serious problem I know this committee is faced with, and our committee, and our colleges and universities, and I hope we can get something along those lines adopted from an overall standpoint and then we will lessen the pressures that are put on us for these special cases that we have.

Mr. MYERS. We again, as Members of this committee, do appreciate your service and your cooperation through the years and wish you well and much success.

Mr. FUQUA. Thank you

Mr. BEVILL. Mrs. Boggs.

Mrs. BOGGS. Mr. Chairman, thank you. I have had the pleasure of working with Mr. Fuqua on two subcommittees. My other subcommittee responsibilities have to do with NASA appropriations and——

Mr. FUQUA. And NSF.

Ms. BOGGS. Yes, and I am especially grateful to you for initiating the study on science education, a program that will live long after all of us here in Congress. I want to thank you for your patience in so many respects, and for assuring that our country will not only be able to save its resources, as the Secretary has tried to do in Florida, but also will be able to go forward with the kind of research and development and energy and water conservation and in opening up the education of all of our children to being literate in science and math and technology, to live in the kind of world of information and communications that they are going to have to survive in, and that our country is going to have to survive in, if we are going to make them properly productive and independent in this world. You have contributed so much to it, and we really are extremely grateful to you.

Mr. FUQUA. Thank you, ma'am.

Mr. BEVILL. Mrs. Smith.

Mrs. SMITH. No questions. Thank you for coming.

STATEMENT OF THE HON. DON FUQUA

BEFORE THE

SUBCOMMITTEE ON ENERGY AND
WATER DEVELOPMENT APPROPRIATIONS

DOE's ENVIRONMENTAL PROGRAMS

I would like to express my continued support for the Department of Energy's Environmental Programs and recommend funding these programs at the Administration's request of $273.9 million for FY 1987.

The Environmental Programs are responsible for assuring the health and safety of DOE workers, environmentally sound operation of DOE facilities, and long-term research on the biological and environmental effects of energy-related technologies. Funding at the Administration's FY 1987 request will allow maintenance of the DOE Environmental Programs, provide for critical environmental surveys of DOE facilities, and expand necessary research on the health effects of exposure to indoor radon.

We also recommend that DOE redirect $1.2 million from general health and environmental research to the nuclear medicine program, which the Administration cut $1.2 million in FY 1987. The DOE nuclear medicine program has led to many breakthroughs in the understanding and treatment of human disease and support for this program should be continued at the FY 1986 level.

Mr. RUDD. I just want to join in the accolade for our colleague here, Mr. Fuqua. I served with him on Science and Technology when I first came here. That committee is unique in that it was founded for the purpose of generally putting us into space, exploring space and keeping us there, and, Don, you certainly have been a great leader in that. There were no rules by which you could establish where we should go and how we should achieve success. You had to be innovative and find out which was the best way to go, and you were able to make the decisions, which is certainly a key to success in anything you do. You have done a splendid job and have been an inspiration to me, and I thank you for what you have done and wish you well in whatever you intend to do.

Mr. FUQUA. Thank you.

Mr. WATKINS. I appreciate your views, coming from my district, and I appreciate your background. They don't realize Don Fuqua is former State President of the Florida Future Farmers of America. In Oklahoma, we had that little common background. I appreciate that background.

Mr. FUQUA. Thank you very much, Mr. Chairman.

THURSDAY, APRIL 11, 1986.

TVA PROGRAMS

WITNESS

HON. JOHN J. DUNCAN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF TENNESSEE

Mr. BEVILL. Next we have our good friend from Tennessee, Congressman John Duncan. We are always glad to have you with us and look forward to hearing your testimony.

Mr. DUNCAN. I have a written statement. I would just file it with the Board.

Mr. BEVILL. Your entire statement will be made part of the record.

Mr. DUNCAN. I want to express in person my continued support for the work that is performed by the Tennessee Valley Authority, not only for our region, but the entire nation. TVA is a lot more than a regional agency because it fulfills a Federal role, it combines itself with local or regional needs and with the national priorities. I guess one of the better programs, of course, is the national fertilizer development programs in Muscle Shoals. I think they provide all the research now for most of the fertilizer needs of the nation.

Some people get the wrong idea about what the TVA does. In fact, the Washington Times, about two weeks ago, said that the taxpayers of the nation were subsidizing electric utilities in the Tennessee Valley, and I answered by a letter to the editor of the paper, which they declined to run, but power, as you well know, is supported only by the consumers of the Tennessee Valley Authority. The TVA is doing a good job, and they are very conservative in their requests, and all we ask is that they be treated fairly along with the other agencies. We are not asking any more than what would be fair for our people and for the Tennessee Valley.

[The statement of Hon. John J. Duncan follows:]

STATEMENT OF THE HONORABLE JOHN J. DUNCAN
BEFORE THE SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT
OF THE HOUSE APPROPRIATIONS COMMITTEE
APRIL 9, 1986

MR. CHAIRMAN, AND MEMBERS OF THE SUBCOMMITTEE, THANK YOU FOR THE OPPORTUNITY TO EXPRESS MY CONTINUED SUPPORT FOR THE WORK PERFORMED BY THE TVA IN MY DISTRICT, THE TENNESSEE VALLEY REGION, AND THE ENTIRE NATION. THE TVA IS MORE THAN JUST A REGIONAL AGENCY. IT FULFILLS A FEDERAL ROLE THAT COMBINES LOCAL OR REGIONAL NEEDS WITH NATIONAL NEEDS AND PRIORITIES. TVA'S LONG-TIME INVESTMENT IN DEVELOPMENT ON THE TENNESSEE RIVER AND ITS POWER GENERATING SYSTEM TEND TO HIDE ANOTHER ROLE. THAT ROLE IS TO SERVE AS A DEMONSTRATION AGENCY, PROVIDING SOLUTIONS TO PROBLEMS THAT ARE COMMON ACROSS THE COUNTRY. THE VALUE OF TVA'S EFFORTS ARE NOT LIMITED TO A SELECTED REGION OF THE NATION. THIS DOUBLE ROLE IS WHAT MAKES TVA UNIQUE.

ONE OF TVA'S PROGRAMS SERVING A NATIONAL AND INTERNATIONAL NEED, IS THE NATIONAL FERTILIZER DEVELOPMENT CENTER IN MUSCLE SHOALS. TVA IS THE LEADER IN FERTILIZER RESEARCH AND DEVELOPMENT. MOST OF THE FERTILIZER TECHNOLOGY IN USE TODAY IS A RESULT OF TVA'S LEADERSHIP. TVA IS ALSO ADDRESSING OTHER IMPORTANT NATIONAL ISSUES. SEVERAL PROJECTS HAVE BOTH AN ECONOMIC AND ENVIRONMENTAL IMPACT. ONE PROJECT INVOLVES THE USE OF HIGH SULFUR COAL BY POWER PLANTS. THE HIGH AMOUNT OF SULPHUR IS THIS COAL LENDS IT UNACCEPTABLE IN ORDINARY CIRCUMSTANCES. TVA IS PROVIDING WATER QUALITY RESEARCH TO ADDRESS PROBLEMS AT MANY PUBLIC AND PRIVATE DAMS. TVA IS DEMONSTRATING THE USE OF ARTIFICIAL WETLANDS AS A LOW-COST WAY TO TREAT INDUSTRIAL AND RURAL WASTE. TVA HAS DEVELOPED METHODS FOR LOW-COST MONITORING AND ASSESSMENT OF TOXIC AIR PROBLEMS. AND THE LAND BETWEEN THE LAKES IS A TESTING GROUND FOR PROJECTS EXPANDING THE USES AND BENEFITS OF PUBLIC LAND - FEDERAL, STATE, AND LOCAL.

THE PRESENT BUDGET ISSUES THAT CONGRESS MUST FACE ARE CAUSING THE REEXAMINATION OF FEDERAL RESPONSIBILITIES. DESPITE MAJOR BUDGET REDUCTIONS IN RECENT YEARS TVA HAS CONTINUED TO PROVIDE THE INSIGHT AND INITIATIVE TO SEEK SOLUTIONS TO NATIONAL PROBLEMS. SOME OF THE EXAMPLES I MENTIONED WERE DEVELOPED IN THIS SAME PERIOD. THESE PROJECTS HAVE BEEN ACCOMPLISHED BECAUSE TVA SOUGHT NEW PARTNERSHIPS WITH THE PRIVATE SECTOR AND STATE OFFICIALS. TVA HAS HELPED CREATE PRIVATE ENTITIES SUCH AS THE FOREST RESOURCES INSTITUTE TO CARRY OUT WORK THAT WAS ONCE PERFORMED WITH FEDERAL APPROPRIATIONS. PROGRAMS THAT NO LONGER FIT NATIONAL PRIORITIES HAVE BEEN ENDED OR REDUCED. FEES ARE NOW CHARGED FOR A NUMBER OF SERVICES WHICH USED TO BE FREE: HUNTER PERMITS, LAND TRANSFERS, ACCESS FEES AND SOME FERTILIZER TECHNICAL ASSISTANCE. I UNDERSTAND TVA HAS EITHER ACCOMPLISHED OR MADE SIGNIFICANT PROGRESS ON EVERY GRACE COMMISSION RECOMMENDATION.

WE ALL RECOGNIZE THAT THERE CONTINUES TO BE DEEP-ROOTED PROBLEMS IN THE TENNESSEE VALLEY REGION THAT CALL FOR SPECIAL ATTENTION. THESE PROBLEMS INCLUDE HIGH UNEMPLOYMENT, AND A LARGER-THAN-AVERAGE NUMBER OF FAMILIES LIVING BELOW THE POVERTY LEVEL. ALTHOUGH IT IS NEITHER WITHIN TVA'S ABILITY NOR ITS RESPONSIBILITY TO SOLVE THESE PROBLEMS, TVA CONTINUES TO FIND WAYS TO IMPROVE THE VALUE OF THE REGION AS A NATIONAL ASSET WHILE DEVELOPING SOLUTIONS THAT CAN BE PUT TO USE OUTSIDE THE VALLEY. ONE EXAMPLE IS TVA'S EXISTING INDUSTRIES PROGRAM WHICH ENCOURAGES THE FULL USE OF LOCAL RESOURCES AND INDUSTRIAL POTENTIAL. ANOTHER EXAMPLE INCLUDES AN EDUCATION PROGRAM WHICH COMBINES ENVIRONMENTAL LITERACY WITH METHODS STRENGTHENING BASIC READING AND MATH SKILLS. EACH ARE BEING USED IN SEVERAL SECTIONS OF THE COUNTRY.

TVA IS THEREFORE MUCH MORE THAN A UTILITY AND NOT JUST ANOTHER FEDERAL AGENCY. I WOULD URGE YOU TO CONTINUE TO MAINTAIN THE SUPPORT YOU HAVE SHOWN IN THE PAST FOR THE TVA. IT WILL CONTINUE TO PROVIDE MANY FUTURE NATIONAL BENEFITS TO THE AMERICAN TAXPAYER. THANK YOU FOR THIS OPPORTUNITY TO APPEAR BEFORE YOU TODAY.

Mr. BEVILL. Well, we appreciate the leadership that you have shown in support of the TVA programs, and we will certainly work with you and hope that we can continue some of those programs that have been recommended in the budget to be eliminated because of the impact and jobs created and the good the programs have done.

You mentioned the fertilizer there, that is internationally known, as you know. During the Vietnam War, when John Myers and I first came up here, I remember well when we went over to visit the soldiers over there. All over the area I kept seeing these Auburn University people out there teaching them how to use the fertilizer developed there by TVA. Those people made three crops a year, instead of one, for the first time.

So, I made the statement many times that the TVA's developed fertilizer probably did more to keep more people from starving in the world, and, of course, increase the standard of living in this country, than all the foreign aid put together.

Mr. DUNCAN. Any state that has a fertilizer manufacturing plan, they will all tell you that they benefit from TVA's research in fertilizer. Of course, the water control program they have benefits every state, I guess, in the Union, and their toxic waste program. It is a good agency.

I can remember back before the TVA that, in my own home, we had neither lights nor running water. It certainly changed things.

I would like to ask consent, if I may, if I could enter the statement that I sent the Washington Times about the power revenues—that our people retired the debt of TVA for power of the dams, and they pay millions of dollars every year into the United States Treasury—I would like to put it in the record.

Mr. BEVILL. Without any objection, it will be made part of the record. Thank you very much.

[The letter to the Editor, The Washington Times, follows:]

TVA

March 17, 1986

Letters to the Editor
The Washington Times
3600 New York Avenue, N.E.
Washington, D.C. 20002

Dear Sir:

The recent Times editorial on the Tennessee Valley Authority (March 8) suggests that the current problems of TVA's nuclear power program create a burden of several billion dollars for "the American taxpayers," throggh bonds sold to the Federal Financing Bank. In fact none of the investment in these plants has come from the taxpayers.

In 1959 Congress authorized TVA to obtain capital for its power poggram by selling revenue bonds in a self-financing program. TVA sold its power bonds in the Wall Street market until 1934, when the Federal Financing Bank was created (at the Treasury's initiative) to coordinate the debt financing of several federal agencies by bwying their bond issues, using funds obtained in the bond market.

TVA has taken both of its operating nuclear plants out of service within the last year because of safety issues. These plants represent about 13 percent of system generating capacity, and obviously TVA wants to get them (and a third new plant) in operation when these problems are

resolved. In the meantime, however, the power system is still operating and still paying its bills, including debt service.

The editorial says TVA "Has no plan for paying back any of the money" invested in its nuclear program. In fact, since this bond financing program began in 1960 TVA has never failed to retire bond issues and make interest payments on schedule. TVA financial practices are audited by Coopers & Lybrand, and also were recently reviewed by the General Accounting Office. Neither one found that TVA practices in repaying debt are different from those of large power companies.

Like many other power systems nationwide, TVA cut back its power plant construction program in recent years after power load growth forecasts changes, and cancelled three projects. TVA is providing a bond retirement fund for the investment in its cancelled nuclear projects, and will pay off those bonds in cash as they come due.

The Federal Government did provide appropriations to build TVA dams and power plants prior to the 1959 legislation. After repayments that investment represents less that 5 percent of the power system's capital structure today. TVA pays the Treasury an annual return on the remaining investment based on the average interest rates on outstanding Treasury bonds, plus continuing repayments. Since 1959 the TVA power system has paid the Treasury $2 billion, which is considerably more than the government's original appropriation investment.

Thus it is difficult to find a burden on the Federal taxpayer here. Instead the power system is self-financed by revenues from customers in the TVA area. While TVA's nuclear problems do affect electric bills for consumers in the region, they are still paying rates well below national averages.

Sincerely,

JOHN J. DUNCAN
Member of Congress

JJD/pa

Mr. MYERS. It is a pleasure working with you, John, and it always has been.

Mr. DUNCAN. I thought it would be a good opportunity to retire.

Mr. MYERS. It is refreshing to see somebody who plans to come back.

Mr. BEVILL. We will save all those good things for when you retire.

Mrs. SMITH. We always appreciate you coming.

Mr. DUNCAN. Thank you very much.

ED JONES
8TH DISTRICT, TENNESSEE
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(202) 225-4714

COMMITTEE ON
AGRICULTURE
CHAIRMAN,
SUBCOMMITTEE ON
CONSERVATION, CREDIT AND
RURAL DEVELOPMENT

COMMITTEE ON
HOUSE ADMINISTRATION
CHAIRMAN,
SUBCOMMITTEE ON
HOUSE SERVICES

APR 1 6 RECD

Congress of the United States
House of Representatives
Washington, D.C. 20515

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KELLY M. SHARBEL, JR.
ADMINISTRATIVE ASSISTANT

April 15, 1986

Honorable Tom Bevill
Chairman
Subcommittee on Energy and Water
Development
Committee on Appropriations
2362 Rayburn Building
Washington, D. C. 20515

Dear Mr. Chairman:

As you know, the administration included in its budget proposal the elimination of appropriated funds for the Tennessee Valley Authority's Land Between the Lakes. As a result of that proposal, I conducted a public hearing in Dover, Tennessee on LBL since the southern entrance to this excellent natural resource area is located in my Congressional district. Attached is a copy of the transcript of that hearing.

Land Between the Lakes represents a great success in the management of natural resources. Like many of TVA's endeavors, it uses innovative and imaginative approaches to the age old conflict of using natural resources while preserving them. LBL is the focal point of a $200 million tourism industry in the Kentucky and Tennessee areas that surround it. It provides an educational laboratory for school children in nearby cities who visit the facility to learn about nature. It provides recreational uses for outdoor sportsmen and hunters. It provides historical documentation for those who study the roots of our past. It also provides a research laboratory for botanists and biologists who seek to learn more about nature.

Each of these points and more are included in the transcript of the hearing which I am providing to you. The transcript covers all of the hearing from start to finish. I respectfully request that this transcript be allowed to be made part of the hearing record for the Energy and Water Appropriations Act of FY87.

I am strongly supportive of adequate funding for those TVA activities that utilize appropriated monies. There is no doubt in my mind that the work that is done in natural resources at LBL, as well as in agricultural research and economic development, can be applied nationwide as we seek to resolve the difficult problems that confront us. Land Between the Lakes is just one example of how successful TVA has been in its many undertakings. I would hope that you and the Subcommittee will give its continued funding favorable consideration.

With kindest regards and best wishes, I am

Sincerely yours,

Ed Jones, M. C.

EJ/st

APR 7 RECD

Association of Tennessee Valley Counties

P.O. Box 24473, Nashville, Tennessee 37202-4473 615/ 374-3487

March 31, 1986

The Honorable Tom Bevill
Chairman, Subcommittee on Energy
and Water Development
U. S. House of Representatives
2362 Rayburn House Office Building
Washington, D. C. 20515

Dear Congressman Bevill:

Submitted herewith is a statement on behalf of this Association that respectfully requests your help to restore appropriations for the Tennessee Valley Authority so its programs and activities can be continued near its present level of funding.

In the event that hearings are conducted by your Subcommittee, a member of our Association would request permission to make a brief statement.

Sincerely,

Mike Miller
President, ATVC

MM/fm

Attachment

STATEMENT OF MIKE MILLER, COUNTY JUDGE/EXECUTIVE, MARSHALL COUNTY, KENTUCKY, ON BEHALF OF THE ASSOCIATION OF TENNESSEE VALLEY COUNTIES* IN REFERENCE TO THE TENNESSEE VALLEY AUTHORITY'S APPROPRIATED BUDGET AS PROPOSED FOR FISCAL YEAR 1986-87, BEFORE THE SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT OF THE COMMITTEE ON APPROPRIATIONS, UNITED STATES HOUSE OF REPRESENTATIVES.

MR. CHAIRMAN, THIS ASSOCIATION APPRECIATES THE OPPORTUNITY TO SUBMIT THIS STATEMENT TO YOUR SUBCOMMITTEE SO THE MEMBERSHIP MAY KNOW OF OUR DEEP CONCERN REGARDING THE ADMINISTRATION'S PROPOSAL TO AGAIN REDUCE TVA'S APPROPRIATED FUNDS. LAST YEAR, YOUR SUBCOMMITTEE HEARD TESTIMONY FROM SEVERAL GROUPS, INCLUDING THIS ASSOCIATION, EXPRESSING UNIFIED SUPPORT FOR TVA AND THE OUTSTANDING JOB THAT IT IS DOING WITH THE APPROPRIATED FUNDS THAT THE CONGRESS MAKES AVAILABLE FOR A VARIETY OF DEMONSTRATION PROGRAMS AND TECHNICAL SERVICES WHICH BENEFIT PEOPLE ALL ACROSS THE UNITED STATES, NOT JUST THOSE IN THE TVA REGION.

MR. CHAIRMAN, YOU WERE VERY HELPFUL AND SUPPORTIVE OF OUR REQUEST LAST YEAR WHEN OMB PROPOSED TO REDUCE CONGRESSIONAL APPROPRIATIONS FOR TVA BY SOME $90 MILLION DOLLARS. THANKS TO THIS SUBCOMMITTEE AND OTHER MEMBERS OF CONGRESS, TVA'S FUNDS WERE RESTORED TO A LEVEL THAT PERMITTED MOST OF THE PROGRAMS AND ACTIVITIES TO BE CONTINUED.

THE OFFICE OF MANAGEMENT AND BUDGET IS NOW PROPOSING TO REDUCE TVA'S FISCAL YEAR 1987 APPROPRIATION BY APPROXIMATELY 50 PERCENT, FROM THE FISCAL

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*THE ASSOCIATION OF TENNESSEE VALLEY COUNTIES WAS ORGANIZED IN 1981, TO IMPROVE THE COMMUNICATION AND WORKING RELATIONSHIP AMONG COUNTY GOVERNMENTS AND WITH TVA, AND TO ENHANCE THE EFFECTIVENESS OF TVA PROGRAMS APPLICABLE TO COUNTIES IN THE TVA REGION.

YEAR 1986 LEVEL OF $113 MILLION TO $58 MILLION (EXCLUDING OVER $4 MILLION DECREASE DUE TO THE GRAMM-RUDMAN-HOLLINS ACT). A REDUCTION OF THIS MAGNITUDE WILL DESTROY VITAL RESOURCE AND ECONOMIC DEVELOPMENT PROGRAMS BENEFITTING OUR NATION.

IT IS THE UNDERSTANDING OF THIS ASSOCIATION THAT OMB'S PROPOSAL WOULD TERMINATE FUNDING FOR THE LAND BETWEEN THE LAKES. THE LAND BETWEEN THE LAKES IS A 170,000-ACRE NATIONAL RECREATIONAL AND ENVIRONMENTAL EDUCATION CENTER THAT WAS CREATED TO SERVE THE PEOPLE OF THE UNITED STATES, EITHER DIRECTLY FOR THOSE WHO VISIT OR INDIRECTLY THROUGH EDUCATIONAL PROGRAMS IN OUTDOOR RECREATION, LAND, OTHER NATURAL RESOURCE MANAGEMENT AND ENVIRONMENTAL EDUCATION ENDEAVORS. WHEN THE LAND BETWEEN THE LAKES WAS ASSEMBLED BY TVA (THE FEDERAL GOVERNMENT) ACQUIRING SMALL FARMS AND HOMESTEADS IN THE 1960'S, IT WAS THE PROMISE THAT IT WOULD ALWAYS BE MAINTAINED AND OPERATED AS RESOURCE AND SERVICE TO THE PEOPLE OF THE UNITED STATES. TO DISCONTINUE FUNDING FOR THE LAND BETWEEN THE LAKES MAY BE TRANSLATED INTO AN UNFULFILLED PROMISE TO THE PEOPLE.

IT IS BEING PROPOSED BY OMB THAT TVA'S ECONOMIC DEVELOPMENT SERVICES BE ELIMINATED BY CUTTING-OFF THE APPROPRIATED FUNDS. THE TVA REGION HAS CERTAINLY MADE ECONOMIC GAINS DURING THE PAST FIVE DECADES, MUCH OF WHICH IS ATTRIBUTABLE TO EXPERTISE AND TECHNICAL ASSISTANCE FURNISHED BY TVA FROM CONGRESSIONAL APPROPRIATIONS; HOWEVER, IT SHOULD BE EMPHASIZED THAT THE VALLEY AREA STILL LAGS BEHIND THE REST OF THE NATION IN FAMILY OR HOUSEHOLD INCOME. TVA'S ECONOMIC DEVELOPMENT SERVICES PROGRAM IS DIRECTED TOWARD

INCREASING ECONOMIC DEVELOPMENT OPPORTUNITIES, PARTICULARLY FOR RURAL AREAS. ONE OUT OF EVERY TWO NEW JOBS CREATED IN THE PAST 15 YEARS IN THE TVA REGION RESULTED FROM EXISTING INDUSTRIES. LAST YEAR, TVA'S EXISTING INDUSTRIES PROGRAM, FUNDED BY CONGRESS, ASSISTED 244 FIRMS TO EXPAND ENOUGH TO CREATE SOME 9,300 NEW JOBS.

TERMINATING TVA'S ECONOMIC DEVELOPMENT PROGRAM FUNDING WOULD RESULT IN A NEGATIVE IMPACT FOR EMPLOYMENT OPPORTUNITIES WITHIN THE TENNESSEE VALLEY REGION, WHICH TRANSLATES INTO REDUCED TAX REVENUE AT THE LOCAL, STATE, AND NATIONAL LEVEL. IT IS DIFFICULT TO QUANTITFY, BUT IT IS THE OPINION OF THIS ASSOCIATION THAT LOCAL, STATE, AND FEDERAL INCOME TAXES GENERATED BY CONGRESSIONALLY-FUNDED TVA ECONOMIC DEVELOPMENT ACTIVITIES PRODUCE MORE GOVERNMENT REVENUE THAN EXPENDED BY CONGRESS ON THE TVA PROGRAMS. WHEN OMB PROPOSES TO TERMINATE TVA OR TVA PROGRAMS, IT IS WITHOUT UNDERSTANDING OR RECOGNITION OF TVA'S HISTORY OR ITS CURRENT ROLE IN SERVICE TO THE PEOPLE OF THE UNITED STATES.

THE OMB PROPOSAL TO ELIMINATE FUNDS FOR TVA AGRICULTURAL RESOURCE DEVELOPMENT, SOIL CONSERVATION/EROSION CONTROL, AND WATER QUALITY IMPROVEMENT PROGRAMS WILL BE TO THE DISADVANTAGE OF PRESENT AND FUTURE GENERATIONS, THE RESULT BEING MERELY A TRANSFER OF EXISTING PROBLEMS. ECONOMICALLY DEPRIVED FARMERS WILL CONTINUE TO NEED TVA'S TECHNICAL ADVISE IN MAKING THE TRANSITION FROM ROW CROPS TO VEGETABLES, FROM TOBACCO TO TRUCK GARDENS, AQUACULTURE, ETC.

WITH CONGRESSIONAL FUNDING, TVA OPERATES THE NATIONAL FERTILIZER DEVELOPMENT CENTER (NFDC). AS THE TITLE INDICATES, THIS IS A NATIONAL

CENTER, WITH INTERNATIONAL ACCLAIM. WHEN THIS CENTER WAS STARTED A SOME 50 YEARS AGO, THE WORLD POPULATION WAS 2.1 BILLION, IN 1984, THE WORLD POPULATION REACHED 4.7 BILLION, AND IT IS EXPECTED TO EXCEED SEVEN BILLION BY THE YEAR 2000. THE NFDC COULD BECOME A MAJOR COMPONENT IN INTERNATIONAL EFFORTS TO MEET FUTURE DEMAND FOR FOOD AND FIBER. IT WOULD APPEAR SHORT-SIGHTED TO REDUCE THE FUNDING FOR THIS IMPORTANT RESEARCH AND DEVELOPMENT PROGRAM.

THE PROPOSED CUTS IN TVA'S APPROPRIATED BUDGET WILL RESULT IN THE TERMINATION OF EMPLOYMENT FOR SOME 700 TVA EMPLOYEES AND CERTAINLY WILL CAUSE PROBLEMS FOR THOSE WORKERS AND THEIR FAMILIES. IN ADDITION, THE TECHNICAL EXPERTISE WOULD NO LONGER BE AVAILABLE TO THE BUSINESSES, INDUSTRIES AND FARMERS TO DEMONSTRATE NEW TECHNOLOGY AND MANAGEMENT PRACTICES THAT EVOLVE INTO NEW JOBS, EXPANDED TAX BASE AND AN OVERALL BETTER WAY OF LIFE. FIRING HIGHLY SKILLED TECHNICIANS WILL ONLY ADD TO THE PROBLEMS OF THE TVA REGION AND CURTAIL OPPORTUNITIES FOR THE PEOPLE TO IMPROVE THEIR SKILLS.

THIS ASSOCIATION SHARES YOUR CONCERN WITH THE BUDGET BALANCING EFFORTS. AS LOCAL ELECTED OFFICIALS, WE KNOW SOMETHING OF, AND APPRECIATE, THE TOUGH DECISIONS FACING YOU IN THE BUDGET MAKING PROCESS. WE BELIEVE THE REVENUE PAID TO THE FEDERAL GOVERNMENT BECAUSE OF TVA WOULD MORE THAN OFF-SET THE APPROPRIATED EXPENDITURES THAT TVA NEEDS TO CARRY OUT ITS WORK OF SOLVING REGIONAL PROBLEMS THAT HAVE NATIONAL SIGNIFICANCE.

MR. CHAIRMAN, YOUR HELP IS RESPECTFULLY REQUESTED TO RESTORE APPROPRIATIONS FOR TVA SO THAT ITS MISSION CAN BE CONTINUED NEAR ITS PRESENT LEVEL OF FUNDING.

TVPPA
TENNESSEE VALLEY PUBLIC POWER ASSOCIATION
1201 CHESTNUT STREET
CHATTANOOGA, TENNESSEE 37402
615/756-6511

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Hickman-Fulton RECC
Hopkinsville, KY

CARLOS C. SMITH
General Counsel

An organization of municipally and cooperatively owned electric power systems purchasing power from the Tennessee Valley Authority.

April 1, 1986

The Honorable Tom Bevill, Chairman
House Subcommittee on Energy & Water Development
Room 2362 Rayburn House Office Building
Washington, DC 20515

Dear Congressman Bevill:

I'm writing on behalf of the Tennessee Valley Public Power Association in support of funding the Tennessee Valley Authority's fiscal year 1987 non-power programs at current appropriation levels.

Members of our association represent the 160 consumer-owned electric utilities which distribute TVA power to nearly eight million users throughout the Tennessee Valley. No one is more keenly aware or recognizes the ongoing need for TVA's valuable resource development programs than our local community-level electric systems which are owned and operated by the people they serve. While sharing Congressional concern about the federal deficit, we strongly oppose any disproportionate cuts in TVA's non-power budget as compared to reductions for other federal agencies in other regions. It is especially noteworthy, we feel, that TVA's budget has been substantially reduced each year for the last several years. Further reductions will stifle and eliminate vital activities that aid the national and regional economy and protect our environment. Such activities include economic development, water quality control, agricultural land management, pollution control, forestry, flood plain management, natural resource and fertilizer development and many other valuable programs so critical to the ecomonic recovery of our important, but still relatively underdeveloped region of America.

I understand your committee will soon hold hearings on TVA's 1987 non-power appropriations. Although I am not requesting that a representative of our association provide hearing testimony at this time, we would be glad to, at your request, if you feel doing so would be useful.

Again, the association, our member electric systems and their consumers across the Tennessee Valley region strongly support TVA FY 1987 non-power appropriations at current levels. Further, I would like to request that this letter be placed in the record of the hearings. Thank you for your support and understanding.

Sincerely,

Jerry L. Campbell

THURSDAY, APRIL 10, 1986.

MAUMEE BAY STATE PARK

WITNESS

HON. MARCY KAPTUR, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF OHIO

Mr. BEVILL. Our good friend and colleague, Congresswoman Marcy Kaptur is here. We are delighted to have you with us. You may submit your statement, if you wish, for the record, and then proceed as you wish.

Ms. KAPTUR. Thank you very much for the opportunity to appear before this committee. I really want to thank you, as chair, and all the distinguished members of the committee and the staff who have helped us to encourage the Army Corps of Engineers to rediscover Lake Erie and its south shore. I am appearing before you today to discuss two projects in my district.

As you may recall, I appeared before this committee a little over a year ago to talk about the need for a major shoreline erosion project in our area. The purpose of this project is to halt the erosion, which is occurring at the rate of 15 feet a year, of a major section of land that the State of Ohio is developing for use as a park.

It is a major job creator for our area, but we can't proceed until the erosion is halted. As you might recall, a study of the proposed project was first authorized in 1974 and initially funded in fiscal 1979. The interim feasibility report was completed in December 1983 and recommended a protective sand beach stabilized by rubblemound, offshore breakwaters, and a rubblemound revetment.

Although the project had not been authorized, your subcommittee was kind enough to include planning and engineering money in the fiscal 1985 energy and water bill and a provision in the subcommittee's section of the supplemental for fiscal 1985 which required the Corps to spend the money.

I am pleased to report that H.R. 6, the Water Resources Conservation, Development and Infrastructure Improvement Act of 1985 contains similar provisions in both the House and Senate versions. Only minor differences on cost sharing need to be worked out.

The Corps has utilized the initial funding to finalize a "Reaffirmation Report" on the overall shore protection project. Survey work, aerial mapping and preliminary design on the western portion of the project will be completed by the Corps during fiscal 1986.

In an effort to remain on schedule, the State of Ohio's Department of Natural Resources plans to initiate construction on the eastern revetment portion of the project in June. This section is necessary to protect the lodge and cabin complex.

In addition, ODNR and the Corps have developed a tentative section 215 agreement to allow for reimbursement or applied credit for work completed by the state. The proposed agreement will enable the state to proceed expeditiously with the eastern revetment and the Corps follow on with the western portion of the project.

The Corps' schedule calls for final preconstruction planning in fiscal 1987. Such planning would include: preparation of technical reports and the General Design Memorandum. However, no funds were included in the President's fiscal 1987 budget request to allow the Corps to complete this final phase of the preconstruction planning process. Therefore, I would respectfully ask the committee to provide an additional $250,000 for completion of the General Design Memorandum. It is my hope that once this phase is completed, we can start construction in fiscal 1988.

As I mentioned in my testimony last time, the Corps has estimated the project cost-benefit ratio at 3.4-1, and the overall park is expected to generate $3 million per year, and we estimate the creation of approximately 2,000 regional jobs related to the development of the south shore of Lake Erie.

The other project I would like to discuss today, Mr. Chairman, and members of the committee, is a project called Reno Beach/Howard Farms, which is a local flood control project in my district. As a consequence of the high water levels throughout the Great Lakes, including Lake Erie, our community is faced with the threat of storm-induced flooding, and this area has historically been an area subject to such flooding.

The first flood control in the area was constructed by local interests between 1902 and 1943. Since that time the State of Ohio and the Federal Government have assisted local interests by making emergency repairs. While the Corps launched "Operation Foresight"—the construction of temporary dikes in 1973, a permanent solution to the problem has not been provided.

This has been the case despite the fact that a flood control dike designed to afford permanent protection was authorized by the Congress in 1948. Post-authorization planning was not initiated by the Corps until 1980 when funding was first provided. At this point, the General Design Memorandum has been completed, and the plans and specifications have been prepared by the Corps Buffalo District.

The President's budget request for fiscal 1987 does not include a construction start for this project. Rather, because of the high lake levels, the Corps has proposed a construction start under the advanced measures program. From a non-Federal standpoint, the advanced measures program would address a smaller area at a much larger cost. Although the Governor has announced that the state is willing to provide half of the non-Federal share, I question the logic of this Administration and the Corps in approving a temporary flood control project under the advanced measures program while the authorized permanent project would provide substantially greater benefits at a lower non-Federal cost.

In addition, given the age of this project and the attitude of this administration toward these types of projects, one must assume that if the advanced measures project is agreed upon that the permanent project would be adversely affected in such a way so as to preclude project completion.

Therefore, Mr. Chairman, I would respectfully ask that the committee consider a $1 million construction start for this project for fiscal year 1987. The total project cost is estimated at $5.6 million.

In addition, the State has expressed its willingness to provide half of the non-Federal share, if a construction start is deemed possible.

Thank you, again, Mr. Chairman, and members of the committee, and staff who have been so helpful, for this opportunity to appear. It is my hope that you will act favorably and provide for continued planning of the Maumee Bay Shoreline project and a construction start for local overdue flood control at Reno Beach/Howard Farms. I stand ready to respond to any questions. I appreciate the interest you have all taken.

[The statement of Hon. Marcy Kaptur follows:]

MARCY KAPTUR

Congress of the United States

House of Representatives

Washington, DC 20515

TESTIMONY

OF THE

HONORABLE MARCY KAPTUR

APRIL 10, 1986

BEFORE

THE SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

COMMITTEE ON APPROPRIATIONS

Mr. Bevill, Members of the Subcommittee, I want to thank you for this opportunity to appear before you today to discuss two projects in my district.

As you may recall, Maumee Bay State park will be a multi-use facility located in Lucas County, Ohio on the south shore of Lake Erie near Toledo. A shoreline protection project is essential to halt the disintegration of the shoreline and to allow the State of Ohio to proceed with the development of the park and related facilities.

A study of the proposed project was first authorized in 1974 and initially funded in fiscal 1979. The Interim Feasibility Report was completed in December 1983 and recommended a protective sand beach stabilized by rubblemound, offshore breakwaters, and a rubblemound revetment. Although the project had not been authorized, your Subcommittee was kind enough to include planning and engineering money in the fiscal 1985 Energy and Water bill and a provision in the Subcommittee's Section of the Supplemental for Fiscal 1985 which required the Corps to spend the money.

I am pleased to report that H.R. 6, the Water Resources Conservation, Development & Infrastructure Improvement Act of 1985 contains similar provisions in both the House and Senate versions. Only minor differences on cost sharing need to be worked out. I expect that reaching an agreement on this issue will not be difficult because the State of Ohio has expressed its willingness on more than one occasion to renegotiate the cost sharing.

The Corps has utilized the initial funding to finalize a "Reaffirmation Report" on the overall shore protection project. Survey work, aerial mapping and preliminary design on the western portion of the project will be completed by the Corps during fiscal 1986.

The Ohio Department of Natural Resources and Speaker Pro Tempore, Barney Quilter have been working very closely with the Corps on this project. In an effort to remain on schedule, ODNR plans to initiate construction on the eastern revetment portion of the project in

June. This section is necessary to protect the lodge and cabin complex which the State is developing.

In addition, ODNR and the Corps have developed a tentative Section 215 agreement to allow for reimbursement or applied credit for work completed by the State. The proposed agreement will enable the State to proceed expeditiously with the eastern revetment and the Corps follow on with the western portion of the project.

The Corps' schedule calls for final preconstruction planning in fiscal 1987. Such planning would include: preparation of technical reports and the General Design Memorandum. However, no funds were included in the President's fiscal 1987 budget request to allow the Corps to complete this final phase of the preconstruction planning process. Therefore, I would respectfully ask the Committee to provide an additional $250,000 for completion of the General Design Memorandum. It is my hope that once this phase is completed, we can start construction in fiscal 1988.

Beyond the obvious environmental value of shoreline protection, there is the added benefit of job creation. Park construction is estimated to create 2,000 new jobs in addition to the creation of permanent jobs in the park. Furthermore, the overall park investment is expected to generate $3,000,000 per year, three dollars for each visitor. The Corps has estimated the project's cost-benefit ratio at 3.4-1.

The other project which I would like to discuss Mr. Chairman, is Reno Beach/Howard Farms, a local flood control protection project in my district. As a consequence of high water levels on Lake Erie, this community, like many others, is faced with the threat of storm induced flooding. This area has historically been an area subject to flooding. The first flood control in the area was constructed by local interests between 1902 and 1943. Since that time the State of Ohio and the federal government have assisted local interests by making emergency repairs. While the Corps launched "Operation Foresight"--the construction of temporary dikes in 1973, a permanent solution to the problem has not been provided.

This has been the case despite the fact that a flood control dike designed to afford permanent protection was authorized by the Congress in 1948. Post-authorization planning was not initiated by the Corps until 1980 when funding was first provided. At this point, the General Design Memorandum has been completed and the plans and specifications have been prepared by the Corps Buffalo District.

The President's budget request for fiscal 1987 does not include a construction start for this project. Rather, because of the high lake levels, the Corps has proposed a construction start under the Advanced Measures program. From a non-federal standpoint, the advanced measures program would address a smaller area at a much larger cost. Although the Governor has announced that the State is willing to provide half of the non-federal share, I question the logic of this Administration and the Corps in approving a temporary flood control project under the Advanced measures Program while the authorized permanent project would provide substantially greater

benefits at a lower non-federal cost. In addition, given the age of this project and the attitude of this Administration toward these types of projects, one must assume that if the Advance Measures project is agreed upon that the permanent project will be adversely affected in such a way so as to preclude project completion.

Therefore, Mr. Chairman, I would respectfully ask that the Committee consider a $1,000,000 construction start for this project for fiscal 1987. The total project cost is estimated at $5.6 million. In addition, the State has expressed its willingness to provide half of the non-federal share, if a construction start is deemed possible.

Thank you again, Mr. Chairman, for this opportunity to appear. It is my hope that your subcommittee will act favorably and provide funds for continued planning of Maumee Bay State Park and a construction start for local over-due flood control at Reno Beach/Howard Farms. I stand ready to respond to any questions you or members of the subcommittee may have. Thank you.

Mr. BEVILL. We appreciate your appearing before the committee and the fine presentation. As you know, this subcommittee has worked very closely with you. We put language in there on that first project, and I am hoping now we will do that this year.

Ms. KAPTUR. I think someone should do a cost-benefit ratio on how much time it has taken to approve the minimal amount of money we have thus far expended on planning. I have never gone through anything like this before. We sure appreciate it.

Mr. BEVILL. I hope we can continue to work with you and be of assistance to you, because I know the committee has supported the project, and I am sure we will do the same thing again this year, and we will do whatever we can.

Are there any questions?

Ms. KAPTUR. Thank you very much.

May I say, Mr. Chairman, I am very impressed with the turnout at your subcommittee meeting.

Mr. BEVILL. The word got around you were coming.

THURSDAY, APRIL 10, 1986.

NEW JERSEY NAVIGATION

WITNESS

JOHN L. BUZZI, CHAIRMAN, MARINE ADVISORY COUNCIL OF NEW JERSEY

Mr. BEVILL. Next is Dr. John Buzzi.

Dr. Buzzi, you may submit your prepared statement.

Dr. BUZZI. Thank you, Mr. Chairman, and members of the committee.

I am John L. Buzzi, Chairman of the New Jersey Maritime Advisory Council. This council was established within the New Jersey Department of Commerce and Economic Development, Office of Business Advocacy, to emphasize New Jersey's position as a maritime state and that industry's impact on our economy.

New Jersey is truly a maritime state. The state transports a quarter of a billion tons of water-borne commerce, the majority of foreign commerce which our nation enjoys, and we provide $1 billion in custom revenues annually.

We didn't come here today to ask for our billion dollars back, but perhaps we will settle for somewhere around ten cents on a dollar.

The state took a major fishing center, and our beach fronts support a $10 billion recreation industry, one of the largest industries in the state.

In summary, we endorse that which is presently included in the President's budget and wish to recommend an additional appropriation allocated among eight projects.

The Arthur Kill Channel in New York and New Jersey—we need to deepen the existing 35-foot deep channel to 40 and 41 feet to service the Howland Hook Marine Terminal, the Exxon Refinery, and the Gulf Port Terminal on Staten Island Shoreline. To start this project in fiscal year 1988, all design and engineering work

must be completed in fiscal year 1987. Since a shortfall of $200,000 for engineering and design work exists, we request that $700,000 be appropriated in fiscal year 1987.

The Arthur Kill South to Fresh Kills, New York and New Jersey—the 35-foot deep existing project precludes full loading. In excess of 10 million tons of petroleum, petrochemicals, specialty chemicals, sulphur and cement are carried in vessels which could utilize deeper waters. For these reasons, we request that $250,000 be appropriated to address those general investigations by the Corps of Engineers for the navigation problems in anticipation of project authorization in pending water resources legislation. Truly this would be a leveraging of Federal study monies into a construction project.

Barnegat Inlet in New Jersey—we wholeheartedly endorse and invite your attention to your providing $6 million in new construction funds for this inlet, which records approximately 800,000 boat transits annually. Unfortunately, in the period 1979 to 1984, 11 lives were lost attributed to events at the inlet. There is a human side to what we are doing here other than dollars and cents. Not only, of course, are we saving some lives, but this would reduce shoaling and gain a leverage benefit of reduced maintenance dredging.

The Cape May Inlet to Lower Township, New Jersey—the shoreline in Cape May and below has suffered severe erosion. We ask that we have $766,000 of general construction funds to construct much-needed groins and beach fill for this area.

The Delaware River in the vicinity of Camden, New Jersey—once again, we support $2.650 million now in the fiscal year 1987 budget. Once again, the State of New Jersey has leveraged a $30 million shore-side investment, providing over 500 full-time jobs. And the South Jersey Port Corporation has entered into an agreement with the Corps to furnish the cost sharing desired by the administration for this work.

The Delaware River Comprehensive Navigation Study—again, the $750,000 presently scheduled for appropriation is supported.

Next is the Delaware River, Philadelphia to the Sea, a tri-state—Pennsylvania, New Jersey and Delaware—facility. Again, we support $20.146 million for continued maintenance of this 40-foot deep channel which serves the entire Delaware Valley Region.

The Kill Van Kull and Newark Bay Channels—after more than 13 years of Corps study, intermingled with various delays, the Kill Van Kull and Newark Bay Channels were authorized for construction in fiscal year 1985. The Port Authority of New York and New Jersey reconfirmed its 1978 intent to provide local cooperation to participate in the required non-Federal cost sharing. The proposed Federal budget recommends only $12 million in fiscal year 1987 to start a $291 million deepening that is required. The Port Authority has requested the Corps to provide the urgently needed additional depth of 40 feet in two years at an estimated cost of $145 million.

Therefore, we ask that the $12 million budget recommendation be raised to a $50 million recommendation to be matched by the Port Authority share of almost $17 million. Again, not a bad deal for leveraging some money.

The New Jersey Intercoastal Waterway. Again, we support the $3.290 million.

The New York Harbor and Adjacent Channels. We are pleased to see $200,000 included. However, we need additional surveys, $100,000 for continued planning and engineering for the Port Jersey Channel, $200,000 for continued planning and engineering for the Claremont Channel.

In closing, I would like to state we consider the overall request consistent with Congressional efforts to reduce unemployment and stimulate economic growth. On behalf of the Maritime Advisory Council, the civic, trade, port, labor and governmental institutions which we represent, let me thank you for this opportunity.

Mr. BEVILL. Thank you very much.

[The statement of John L. Buzzi follows:]

STATEMENT BY DR. JOHN L. BUZZI, P.E., CHAIRMAN
NEW JERSEY DEPARTMENT OF COMMERCE AND ECONOMIC DEVELOPMENT
MARITIME ADVISORY COUNCIL
ON BEHALF OF APPROPRIATIONS IN FISCAL YEAR 1987
FOR FEDERAL CHANNEL AND RELATED DEVELOPMENT IN NEW JERSEY
BEFORE THE SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT
OF THE HOUSE AND SENATE COMMITTEES ON APPROPRIATIONS
CONGRESS OF THE UNITED STATES
WASHINGTON, D.C.

APRIL 10, 1986

REPRESENTING ALSO:

BAYONNE CHAMBER OF COMMERCE (N.J.)
BOARD OF PILOT COMMISSIONERS, STATE OF NEW JERSEY
CITY OF SALEM MUNICIPAL PORT AUTHORITY
DELAWARE RIVER AND BAY AUTHORITY
DELAWARE RIVER PORT AUTHORITY
HUDSON COUNTY CHAMBER OF COMMERCE
INTERNATIONAL UNION OF OPERATING ENGINEERS
JOINT EXECUTIVE COMMITTEE FOR THE IMPROVEMENT OF THE DELAWARE
MARITIME ASSOCIATION OF THE PORT OF NEW YORK AND NEW JERSEY
MARINE TRADES ASSOCIATION OF NEW JERSEY
NEW JERSEY ALLIANCE FOR ACTION
NEW YORK-NEW JERSEY PORT PROMOTION ASSOCIATION
PENJERDEL (PA, NJ, DEL) COUNCIL
TOWBOAT AND HARBOR CARRIERS ASSOCIATION OF NEW YORK AND NEW JERSEY
PILOTS ASSOCIATION FOR THE BAY AND RIVER DELAWARE
PORT AUTHORITY OF NEW YORK AND NEW JERSEY
SAVE OUR PORT COALITION
SOUTH JERSEY PORT CORPORATION
UNITED NEW JERSEY SANDY HOOK PILOTS BENEVOLENT ASSOCIATION
UNITED NEW YORK SANDY HOOK PILOTS BENEVOLENT ASSOCIATION

Mr. Chairman and members of the Committee, I am John L. Buzzi, Chairman of the New Jersey Maritime Advisory Council. This Council was established within the N.J. Department of Commerce and Economic Development, Office of Business Advocacy to emphasize New Jersey's position as a Maritime State and that industry's impact on our economy.

New Jersey is truly a Maritime State. The waterways which are contiguous to our State transport a quarter billion tons of waterborne commerce annually, they include the arteries for the shipping of the majority of the foreign commerce which our nation enjoys, and they provide a billion dollars in custom revenues annually. Our Atlantic Coast communities, with their unparalleled beach fronts, support a ten billion dollar recreation industry and our State is a major fishing center on the Atlantic Coast.

I endorse that which is presently included in the President's budget and will address those projects, which if not sufficiently authorized and funded by Congress, will have an adverse effect on the economic well being of our state.

Summary of Recommendations

In addition to the projects which we support as funded in the budget, the New Jersey Maritime Advisory Council wishes to recommend an additional appropriation of $40,294,000 in Federal funds in FY'87 allocated among eight projects. The Federal budget allotment for these eight projects is $17,422,000. The following statement shows project recommendations:

		Recommendations	
Project	Type	Budget Request	Local Interests
Arthur Kill Channel, NY & NJ	Study	500,000	700,000
Arthur Kill South to Fresh Kills, NJ & NY	Study	None	250,000
Cape May Inlet to Lower Township, NJ	Construction	None	766,000
Cold Spring Inlet, NJ	Operations & Maintenance	122,000	300,000
Kill Van Kull & Newark Bay Channels, NY & NJ	Construction	12,000,000	50,000,000
New Jersey Intracoastal Waterway, NJ	Study	None	100,000
New York Harbor & Adjacent Channels, NJ & NY	Study	200,000	600,000
New York Harbor Collection & Removal of Drift, NY & NJ	Construction	4,600,000	5,000,000
TOTAL		17,422,000	57,716,000

ARTHUR KILL CHANNEL, NY & NJ

On March 7th, the Corps of Engineers' Board of Engineers for Rivers and Harbors, approved a feasibility study for improving the Federal channel from the confluence of the Kill Van Kull and Newark Bay Channels to the Exxon and Gulfport petroleum terminals. This critical channel improvement project will deepen the existing 35-foot deep channel to 41 feet to the Howland Hook Marine Terminal, and to 40 feet from the Howland Hook Marine Terminal to the major private users, the Exxon

refinery in Bayway and the Gulfport Terminal on the Staten Island shoreline. Deepening and widening of this channel is vital to improving ship handling capabilities at Howland Hook and for the shipment of bulk products to terminals on the Arthur Kill. The improvements will also eliminate potentially dangerous navigational hazards to vessels by the widening of sections of the channel.

In order for construction to start on this project in FY'88, all of its design and engineering work must be completed in FY'87. Since a shortfall of $200,000 for design and engineering work exists, we therefore request that $700,000 be appropriated in Fiscal Year 1987 for this project so that the Corps can complete its work and be prepared to move forward with construction in Fiscal Year 1988.

ARTHUR KILL SOUTH TO FRESH KILLS, NJ & NY

The 35-foot deep existing Federal project in the Arthur Kill South to Fresh Kills precludes the full loading of liquid and dry bulk cargo ships destined for shoreside facilities. This situation requires that large oceangoing vessels either light load at substantial loss of economy, or perform expensive lightering operations. Local interests in both New York and New Jersey request deeper channels to streamline operations, realize considerable transportation savings and enhance adjacent underutilized properties to accommodate additional facilities.

Six deep-draft bulk facilities along the Arthur Kill extension handle annual cargo in excess of 10 million tons. Petroleum, petrochemicals, specialty chemicals, sulphur and cement are carried in large modern vessels which could immediately benefit from substantial savings if the existing channels were deepened.

For these reasons it is requested that $250,000 be appropriated in Fiscal Year 1987 so a general investigation by the Corps of Engineers can start to address the navigation problems of the Arthur Kill South to Fresh Kills in anticipation of project authorization in pending water resources legislation.

BARNEGAT INLET, NJ

Barnegat Inlet is located on the Atlantic Coast of New Jersey in Ocean County. It is a busy inlet which records approximately 800,000 boat transits annually. We invite your particular attention to providing $6,000,000 in new construction funds to initiate construction of a new south jetty at Barnegat Inlet. This new jetty is required to correct channel shoaling, wave activity and dangerous navigation hazards which have contributed to the loss of 11 lives at the inlet during the period from 1979-1984. The proposed improvement plan, which includes dredging of the channel, will provide mariners safe access through the inlet and as designed, will reduce shoaling and maintenance dredging costs over the long term.

CAPE MAY INLET TO LOWER TOWNSHIP, NJ

The shoreline in Cape May and below Cape May has suffered severe erosion since the construction of the Cape May Inlet jetties in 1911. This has been to the detriment of the recreation industry and causes repetitive storm related damages.

The Corps has done advance engineering and has recommended a project to restore the damage caused by the Cape May navigation jetties. They have recommended that this work be done and we ask that this project, which provides for groins and beach fill be authorized and funded with $766,000 of Construction General Funds to permit the work to be undertaken.

COLD SPRING INLET, NJ

Cold Spring Inlet provides the access to the Atlantic Ocean for the fishing fleet which has made Cape May the second largest fishing port on the Atlantic Seaboard. The Inlet also is the entrance for Coast Guard craft which serve the Coast Guard Base and Training Center in Cape May. This Inlet is also important as a feature to support the recreation/tourism industry in Cape May.

Cold Spring Inlet is authorized as a 20' deep project. Current depths are under 13' and insufficient maintenance funding for FY'87 is provided even though a further deterioration of controlling depths can be forecast for this year. We urge that an additional $178,000 of Operation and Maintenance funds be provided for maintenance dredging for this project in FY'87.

DELAWARE RIVER IN THE VICINITY OF CAMDEN, NJ

We support the Corps of Engineers proposal to dredge a 37-foot deep approach channel to the Beckett Street Terminal facility in Camden and urge the provision of $2,650,000 of new construction funds for this project.

In recent years the South Jersey Port Corporation has invested $40 million to make their port terminals as modern and efficient as any break-bulk and dry-bulk cargo facility on the East Coast. This investment has been particularly important to our region because Camden is one of the most economically depressed urban areas of our country. The South Jersey Port Corporation marine terminal facilities provide a major economic contribution to the area by generating $30 million in Port related revenue and providing over 500 full-time jobs.

Unfortunately, their investment cannot be fully utilized because of the limitations on shipping activities caused by the present inadequate 30-foot deep vessel approach to the Beckett Street Terminal. This limitation has long been recognized and the planned deepening to the 37-foot level has been authorized since 1919, but has yet to be done.

To prevent any further delay in the implementation of this project, the South Jersey Port Corporation has entered into an agreement with the Corps to furnish the cost sharing desired by the administration for this work. We urge Congress to appropriate the $2,630,000 requested by the Corps of Engineers in order to facilitate this new construction start in FY'87.

DELAWARE RIVER COMPREHENSIVE NAVIGATION STUDY, NJ, PA & DEL

We also wish to support the President's proposed budget appropriation of $850,000 to continue the Delaware River Comprehensive Navigation Study to determine the potential need to deepen both the Maurice River and the Salem River in New Jersey. These study areas, have been found to be independent of the main channel, which were not covered by the interim report, and have been accelerated with sponsorship by the City of Salem and Cumberland County.

DELAWARE RIVER, PHILADELPHIA TO THE SEA, PA, NJ & DEL

This project is extremely important to the economic well being of southern New Jersey. The Camden-Gloucester area continues to harbor some of the most depressed areas in our state. The presence of the South Jersey Port Corporation, in Camden; Holt Terminals, in Gloucester City; and the Trailer Marine Transport Terminal, in Camden County are port facilities which are of significant importance to the economy of this region. For these reasons, New Jersey, together with our neighboring states of Delaware and Pennsylvania, supports the appropriation of $20,146,000 for the continued maintenance of the Philadelphia to the Sea 40-foot deep channel so that this project may continue to serve the entire Delaware Valley Region.

KILL VAN KULL AND NEWARK BAY CHANNELS, NY & NJ

A project of major importance to New Jersey is the Kill Van Kull and Newark Bay Channels Project. After more than 13 years of Corps study intermingled with various delays, this project is at last authorized for construction in the Fiscal Year 1985 Supplemental Appropriations Act (Public Law 99-88) and is further recommended for authorization in currently pending Federal port legislation, namely, H.R.6 and S-1567. The Port Authority of NY & NJ (PANYNJ) reconfirmed its 1978 intent to provide local cooperation for this project and also notified the Assistant Secretary of the Army for Civil Works of its willingness to participate

in the required non-Federal cost-sharing for this project.

The proposed Federal Budget recommends $12 million in FY'87 as a start to a $291 million deepening of this project to a depth of 44-feet from its present depth of 35-feet. Given the long delay that has already occurred in realizing this improvement, the PANYNJ has requested the Corps to provide the urgently needed initial depth of 40 feet in two years. The latest estimated total cost of this depth is $145.4 million. Under cost-sharing the PANYNJ will provide 25 percent or $36.3 million during construction. The Federal Government's contribution is thereby reduced to $109.1 million or 75 percent.

The $12 million Budget recommendation appears to be seriously inadequate for completing a $109 million construction program in a reasonable period of time. Therefore, we urge a Federal appropriation of $50 million for FY'87 to be matched by the PANYNJ share of $16.7 million to achieve this two-year schedule.

NEW JERSEY INTRACOASTAL WATERWAY, NJ

The New Jersey Intracoastal Waterway (NJICW) has only been constructed to a 6-foot depth and is the most restrictive link in the Inland Waterway between New England and Florida. Although this project has been authorized for a 12-foot depth since 1946, it remains unconstructed due to unresolved and difficult wetlands and bridge problems, primarily in the Atlantic City and Longport New Jersey areas.

Nevertheless, this should not allow the entire NJICW to continue to suffer inadequate dimension throughout its 100 mile length. The numerous inlets to and from the Atlantic Ocean to the NJICW suggests that improvements in depth and width are warranted. An appropriation in the amount of $100,000 is required to initiate such a study and it is requested that the Congress approve this amount and authorize such a study.

Of particular importance to New Jersey with its multi-billion dollar resort industry is the NJICW. We wish to note that the $3,290,000 of Operations and Maintenance funds in the administration budget for this project is the mere minimum required to support the New Jersey link of the Atlantic Coast Inland Waterway and urge Congress to make this appropriation.

NEW YORK HARBOR AND ADJACENT CHANNELS, NJ & NY

This Department was pleased to see $200,000 included in the proposed Budget for the New York Harbor and Adjacent Channels Project in FY'87 to complete the final survey report for the Claremont Terminal and Port Jersey Channel. These studies, authorized by Congress in 1968 and 1980, respectively, were consolidated and initiated within this project to determine the feasibility of deepening the privately-maintained 24-foot deep Claremont Terminal and 35-foot deep Port Jersey Channels for commercial deep-draft navigation.

Although the proposed FY'87 funding will be sufficient to complete the final study report by the Corps of Engineers by June 1987, New Jersey requests the addition of $100,000 for Continued Planning and Engineering (CP&E) for the Port Jersey Channel, as well as $200,000 for Continued Planning and Engineering for the Claremont Terminal Channel. This added funding will allow these vitally important projects to continue without delay beyond the final survey report and into the next phase in an uninterrupted manner.

We are anxious for these projects to progress because of their significant impact on our region's economy. The Port Jersey Channel serves 13 container lines and handled more than 15% of the total container traffic in the New York and New Jersey Port District while providing on-site employment to 600 people. The 24-foot deep Claremont Terminal Channel presently employs 200 people from the region and handles in excess of 40% of the scrap metal shipped from the Port District annually.

As part of the New York Harbor and Adjacent Channels Project we also request an appropriation of $100,000 to revisit and study the feasibility of modifying the Ambrose and Anchorage Channels, which are also part of this project. The larger petroleum and petro-chemical deep-draft tanker vessels now in the world market are able to realize immediate savings by utilizing the naturally deep water of the Upper New York Bay Anchorage off Staten Island. Since the Corps of Engineers has authorized private interests to mine sand from its lower reaches to a depth down to 53 feet, an authority which could be extended upstream in the future, a deepening of this 45-foot Federal waterway to serve this anchorage would be considerably reduced in cost.

In summary, we ask that the Budget recommendation of $200,000 for the New York Harbor and Adjacent Channels Project be increased to $600,000.

NEW YORK HARBOR COLLECTION AND REMOVAL OF DRIFT, NY & NJ

With construction underway since 1976, this waterfront clean-up project is aimed at the removal of 2,230 sunken hulks and 149 decaying shore structures that are the sources of dangerous, unsightly and costly harbor drift.

The recommended appropriation of $4,600,000 is a welcome improvement to prior fiscal year appropriations for the project. However, in order to keep pace with local targets and the availability of local financial resources, we request that a modest $400,000 be added to allow for the completion of design work and the initiation of construction in additional areas which include Jersey City, New Jersey.

SALEM RIVER, NJ

I invite particular attention to the need to support the $718,000 in O&M funds for dredging the Salem River. This funding is needed to provide adequate depth and cooperate with local interests in the development and expansion of their port facility.

Since 1983 the Salem Port Authority, with local funds and a modest amount of matching monies, have bought a new port facility to South Jersey into being. This facility is now moving farm, seafood, lumber, frozen meat and scrap iron products in and out of Southern New Jersey. This port has been a positive influence on area businesses and provides a contribution to the U.S. need for more exports. The resourcefulness of the City of Salem should be recognized with this needed O&M appropriation.

# # #

We consider our overall request consistent with congressional efforts to reduce unemployment and stimulate economic growth. Delays in these waterway projects can cause higher port costs, loss of employment and terminal construction and slow future economic recovery. The area in which the above study projects are located is in need of economic stimulation and we hope you will favorably consider our recommendations.

On behalf of the Maritime Advisory Council, the civic, trade, port, labor and governmental organizations listed on the cover sheet of this statement which we represent and myself, let me thank you for the courtesy of presenting our recommendations to you. I will be pleased to try to answer any questions you may have.

THURSDAY, APRIL 10, 1986.

PRAIRIE BEND UNIT, NEBRASKA

WITNESSES

MICHAEL E. DENNIS, EDUCATION PROJECT DIRECTOR, NEBRASKA WATER CONSERVATION COUNCIL (NWCC) RICHARD COOK, BOARD OF DIRECTORS, SAVE OUR LAND ORGANIZATION (SOLO)

Mr. BEVILL. Mr. Dennis, we are pleased to hear from you. Mr. Dennis, proceed as you wish.

Mr. DENNIS. Thank you, Mr. Chairman, Mrs. Smith, and members of the subcommittee. My name is Michael Dennis. I am accompanied today by Mr. Richard Cook—representing a different organization. We will split this time, if you don't mind.

I also prepared two exhibits, and would seek your help in getting those into the record.

My name is Michael Dennis. I am the Education Project Director with the Nebraska Water Conservation Council. This is a 5,000-member citizen lobby organization which seeks to educate Nebraskans about sound water conservation and management policy.

Over the past 30 months, the Bureau of Reclamation has been conducting a feasibility study in Nebraska. Its 1987 budget request, if funded, would bring the study to the point of project construction authorization if Congress should so choose to do that.

The council has been actively involved in this study process, and we do support fiscal year 1987 funding for the feasibility study, provided that the several remaining objectives can be accomplished. These remaining objectives include study of Platte River water availability, the wildlife habitat requirements and project economic analysis using current crop price and yield figures. These are discussed in detail in my written testimony; therefore, I won't go through it here.

The project would divert water from the Platte River, but the availability of water depends on meeting needs for Federal endangered species. Failure to address these questions of water availability are the reason for halting every Federal water development initiative to the Platte River. The study has gone farther to answer these questions.

However, the position of the bureau at the present time is that it need not complete several studies which private wildlife management interests and organizations feel is essential if any decision is going to be made to support water projects in the Platte Basin. We cannot overstate the critical need for any management decision now or in the future based on information which could come out of this feasibility study.

Water development on the Platte River is not impossible but requires at a minimum a consensus of a number of competing organizations. We think we can do this through the remaining study period provided the subcommittee and Appropriations Committee may specifically request the bureau to do this.

Thank you very much.

[The statement of Michael E. Dennis follows:]

Nebraska Water Conservation Council
910 'L' Street Lincoln, NE 68508 402/476-2060

TESTIMONY OF MICHAEL E. DENNIS
EDUCATION PROJECT DIRECTOR, NEBRASKA WATER CONSERVATION COUNCIL

BEFORE THE SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT OF THE
U.S. HOUSE OF REPRESENTATIVES COMMITTEE ON APPROPRIATIONS

PRAIRIE BEND UNIT, BUREAU OF RECLAMATION, FY87 BUDGET

APRIL 10, 1986

Mr. Chairman, Members of the Subcommittee:

My name is Michael Dennis, I am the Education Project Director, Nebraska Water Conservation Council (NWCC). NWCC is a 5000 member, citizen lobby organization which seeks to educate Nebraskans about sound water conservation and management, and to support legislation and policies to bring this about. The Water Education Project, which I Direct, provides research and program support for NWCC.

NWCC was formed four years ago specifically to conduct a campaign to deauthorize the Norden Dam-O'Neill Unit on the Niobrara River in north-central Nebraksa. Our success in that work is reflected in part in the current planning of a non-dam alternative. Almost three years ago NWCC began to broaden its program to include other Nebraska water issues. These have included establishing legal protection for instream uses of river water and groundwater quantity and quality protection. NWCC has been actively involved in the current feasibility study process on the Prairie Bend Unit in the central Platte River valley. This study and the Platte River are the basis of my testimony today.

NWCC supports FY87 funding for Prairie Bend Unit feasibility study, provided the study can accomplish several objectives. These are study of

of Platte River water availability, wildlife habitat requirments, and economic analysis utilizing current crop price and yield information. These are discussed below.

The Bureau of Reclamation is 30 months into a feasibility study for the Prairie Bend Unit in Nebraska. FY 87 budget requests, if funded, will bring the Bureau to the end of its "two-stage" planning. At that point Congress may consider project construction authorization. There are other studies and other projects under review on the Platte, North Platte, and South Platte Rivers in Colorado, Wyoming, and Nebraska. These include the Narrows Unit and the Platte River Joint Management Committee sudy that grew out of stalemate on Narrows wildlife problems, Federal Energy Regulatory Commission relicensing of Kingsley Dam on Lake MacConnaughy, and other projects, both private and public. Bureau study on Prairie Bend has already provided information that is highly important for management decisions on all Platte River basin projects.

While Prairie Bend project alternatives have been presented to the public for review, a preferred plan has not been selected by the Bureau. That plan, originally due last September, is now due in May. Economic and environmental benefits of the alternatives remain unclear. Study of the availability of water from the Platte River, which are limited due to endangered species and migratory waterfowl needs, have not been completed.

Preliminary benefit/cost analysis of project alternatives for agriculture would not support project construction. Although b/c ratios above 1:1 were projected, assumptions of crop price and yield were, in the opinion of NWCC, inflated and violated the Principle and Guidelines for water project planning. Initial Bureau prices were 30 percent above those set by USDA for project analysis, while crop yields were 30 percent to 50 percent higher than current Prairie Bend area yields. Following public and state government criticism

the Bureau promised to reevaluated its analysis. We are awaiting a new b/c analysis of the alternatives.

Stabilizing area groundwater levels is the primary objective of Prairie Bend study. Eighty-five percent of the study area is irrigated, primarily from aquifers, and 95 percent of area crop production is corn for grain. Diversions from the Platte River would be used to "recharge" these declining aquifers to continue intensive corn production. Without supplemental waters, the Bureau projects that up to 40,000 acres could be forced into dryland crop production. Additional acreage could suffer from increased pumping costs. The Bureau also believes that management controls on groundwater use can stabilize production losses at the 40,000 acre-level.

Enhancement of groundwater quality is another study objective. Nitrate contamination from nitrogen fertilizers is a major problem. This is a particular problem in Prairie Bend due to the high use of irrigation and intensive corn production in association with shallow water tables. Average nitrate concentrations in a 40-mile area between Kearney and Grand Island are twice the federal Safe Drinking Water Act standard and are deteriorating. Communities have been forced to abandon drinking water wells, and increasingly turn to the Platte River alluvial sands for new supplies. Project alternatives presented by the Bureau would have limited or uncertain benefits for groundwater quality. According to the Bureau, fertilizer management could stabilize contaminant levels. Analysis has, however, been rudimentary and confidence cannot be assigned to Bureau conclusion, NWCC believes.

Prairie Bend would divert water from the Platte River. Availability of water depends on meeting the needs of federally endangered species and migratory waterfowl needs. Failure to address the questions of water

availability for these needs has been a reason for halting every federal water development initiative in the Platte River basin. Prairie Bend feasibility study has gone very far to answer these questions. However, the position of the Bureau at present is that it need not complete several of the studies that private wildlife management interests feel is essential if any decision is going to be made in support of water development projects. We cannot overstate the critical need for any management decision made now or in the future to be based on information that can come out of the Prairie Bend study process. Conflicts will not be resolved without this.

Several technical tasks remain. First, there is a need to quantify instream flows needed to maintain wildlife habitat. This is a two-step process requiring selection and verification of a hydraulic simulation model, and demonstration of the models predictive capability against biologic models for wildlife species. The Bureau is not proposing to verify its existing simulation model, although species models are contemplated. Second, flow management alternatives of water development and instream needs must be established. This will require a daily flow management model. This model exists and has been tested for a small portion of the Platte River. It is, however, inadequate, since it does not include predictive capability for the North and South Platte Rivers. We cannot rely on monthly flow models to give needed management information. The Bureau has indicated it will not complete the daily flow analysis. Finally, a sediment transport model is needed to understand which flows are needed to maintain a clear, unvegetated, braided channel in the Platte. The Bureau contemplates work on this sediment model.

The Bureau should be specifically directed to complete the water availability and wildlife anaysis.

The Nebraska Water Conservation Council support completion of the Prairie Bend feasibility study, provided the Bureau fully completes needed economic and Platte River analysis. The Council has separately criticized the Bureau in the past several months for conduct of its public involvement process and its deficient presentation of conservation alternatives to Platte River diversion. These reports by the Council are included as exhibits to this testimony for your review. The Bureau has improved, in our opinion, the conduct of its public process, but must still meet a number of the informational requests brought to it by the Council and others. We remain actively committed to the public involvement process.

Water development on the Platte River is not impossible, but requires, at a minimum, the consensus of a number of diverse interests. Through the remaining feasibility study process the Bureau and Prairie Bend project proponents have the ability to make and strengthen that consensus. This cannot be acheived unless the study needs addressed above are met.

Thank you for your time and consideration of this testimony.

# # #

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Water Education Project
Nebraska Water Conservation Council
910 'L' Street, Lincoln, Nebraska 68508 402/476-2060

Staff Report: Bureau of Reclamation Prairie Bend Feasibility Study

January 14, 1986

Introduction.

The Prairie Bend Unit is not new. Its major project components, as well as its water rights applications for Platte River waters, date to the Mid-State Unit of the Pick-Sloan/Missouri Basin Program. Mid-State was "deferred" in 1975, when the local, sponsoring reclamation district was denied reauthorization in a highly charged election. When water rights applications were subsequently rejected by the Nebraska Department of Water Resources, new applications for the same project water were filed.

Rapid expansion of groundwater-supplied, center pivot irrigation the past two decades have developed most of the remaining irrigable project lands. The current Prairie Bend study by the Bureau of Reclamation examines the feasibility of delivery of supplemental surface waters to replace depleting groundwaters. Further irrigation expansion could also result.

Debate surrounding Prairie Bend is also not new. The diversion of Platte River water for the project further jeopardizes dwindling streamflows and critical wildlife habitat. Project canals and reservoirs again threaten to disrupt or inundate hundreds of farming operations and one entire community. Concerns by farmers also include unplanned damage from seepage and unwanted local taxes and groundwater recharge fees.

The central role of the Bureau of Reclamation in Prairie Bend has not changed. After two and a half years, the Bureau is nearing an important landmark in a congressionally authorized feasibility study. In March 1986, the Grand Island Bureau office will announce the selection of its "preferred" plan and pass study findings to higher Bureau officials for review. It will also initiate project preconstuction activity.

Research by the Water Education Project (WEP) into Prairie Bend stems primarily from concern for protecting groundwater quantity and quality. Groundwater conservation and management alternatives to major surface water diversion projects have been suggested. Issues of the long-term sustainability of the Platte River, soil and groundwater resources, as well as for area agriculture and communities depends in part on policy and resource decisions made in the current Prairie Bend planning process.

WEP's staff report briefly reviews the Bureau's Prairie Bend Unit feasibility study. The report is critical of the Bureau for failing to meet the authorized study objectives.

A future report by the Water Education Project will examine Prairie Bend Unit economics.

Background

On July 30, 1983, Congress passed Public Law 98-63 (97 Stat. 301) authorizing expenditures for the Prairie Bend Unit feasibility study. Study purposes were:

> . . .irrigation, stabilization of ground-water levels, enhancement of water quality, small community and rural domestic water supplies, management of fish and wildlife habitat,

public outdoor recreation, flood control, and other purposes determined to be appropriate. (emphasis added)

The study effort may be considered unique in its further specific requirements for a "detailed report on any effects the proposed project may have on wildlife habitat, including the habitat of the sandhill crane and the endangered whooping crane." This includes the development of "alternative water management plans" consistent with the federal Endangered Species Act.

In Feburary, 1984, the Bureau released a Plan of Study which detailed major study objectives, planned technical and program analysis, and the public involvement plan which included a planning calender. The Bureau identified a "two-stage" project planning process that would accelerate project review. This study process was new for the Bureau Denver (now Billings) region.

Public involvement was a key factor allowing this fast-track process. Primary public input was slated through a Public Values Group of interested citizens and organizations. Technical advisory groups made up of interested government agency, university, and private experts were also identified. Regular release of information was the third public involvement element.

Local Bureau feasibility study would culminate in the Plan Formulation Working Document with the recommended or "preferred" project plan. According to the Plan of Study, the PVG would "help identify and promote the preferred plan." The plan would be selected from several alternatives. The Bureau would "Consider [public] comments and attempt to eliminate those conceptual alternatives which demonstrate high levels of public nonsupport." Original document release scheduled for September 1985, is now set for March 1986.

In March, the Bureau will initiate its Draft Preconstruction Plan of Study. The Regional Director's Report, Final Preconstruction Plan, and draft environmental impact statement (EIS) would follow together in 1987.

Public Involvement

As described above, the Public Values Group (PVG) is the primary source of public input and information. In the Plan of Study the Bureau said it would:

--use the PVG to "test ideas generated in the Bureau and for reporting progress and information."
--"fully consider all comments, suggestions, or recommendation or the PVG and would share reasons for adopting or rejecting its recommendations."
--"report conceptual alternatives to the PVG and receive concepts from that group."
--"consider comments and attempt to eliminate those conceptual alternatives which demonstrate high levels of public nonsupport."
--"report (summarize) the analysis of selected alternatives (those not eliminted for cause) and present to [the] PVG."

To date, the Bureau has failed to substantially meet these objectives: the public is guessing at Bureau progress; information has been given in piecemeal and fragmented form; conceptual and even specific alternatives received from the PVG have seemingly disappeared; comments on Bureau

alternatives have been ignored; the Bureau refuses to recognize "high levels of public nonsupport" by a large local farm group for placement of canals and reservoirs in their area; alternatives have not been analyzed and reasons for elimination of several have not been given.

The Bureau established eight technical advisory groups (TAGs) of interested experts from outside the Bureau. The function of the TAG's was to "assure acceptance and support of methodology and technical adequacy," according to the Plan of Study. The TAGs should serve as an important source of independent public information and analysis. At a minimum TAG members could interpret Bureau study progress.

TAG's were formed in the areas of engineering, economics, hydrology, water quality, land resources, environment, recreation, and sociology. Except for environment, which has assisted in wildlife habitat efforts, the TAGs have either never met or have been virtually nonfunctional. The environment TAG has not been active since last spring.

A third public involvement element was to have been the regular release of information to the public. The Plan of Study identified "newsletters, fact sheets, and news releases" as the primary sources. To date, however, information of this type has been nonexistent. The Bureau has been responsive to specific questions from the Water Education Project, but has not otherwise been forthcoming with information on issues, such as groundwater quality, which the WEP has repeatedly identified as being a major concern.

The Bureau's original pricetag on public involvement--"between 5 and 10 percent of the total study costs," according to the Plan of Study--could have been called substantial. At this point, however, the Bureau doesn't seem to have given the public its promised share.

Need for Prairie Bend

Need for the Prairie Bend project should be based foremost on water quantity. At the earliest PVG meetings and in correspondence, participants insisted that the first steps for Bureau study of water quantity should:

1. quantify the project groundwater deficiencies.
2. justify the need for supplemental water from the Platte River.
3. quantify available Platte River supplemental supplies.

Comments specifically cautioned the Bureau against proceeding to design a project without taking these first steps. PVG members strongly urged study of groundwater conservation as an alternative to supplemental water. Platte River diversion could not otherwise be justified, they argued.

A Bureau estimate of the project groundwater deficit has been made. The present annual deficit is estimated at only 18,900 acre-feet. If irrigated activity expanded the deficit might increase. The Bureau has not, however, prepared a conservation alternative to justify diversion. This is discussed below.

At present, the Bureau is still in the process of quantifying the available Platte River waters. The principle cause for current delay is the difficulty in measuring streamflows, especially as these relate to wildlife habitat.

Although the Bureau has not justified the need for supplemental waters or quantified available supplies, it has identified construction alterntives. Likely Bureau projects would divert between 120,600 and 207,400 acre-feet of Platte River water annually. Construction features appear identical to those in the Mid-State project.

Groundwater Management

The critical water resource issue in Nebraska today is conservation of underground water. The Prairie Bend project encompasses what has been described as "the heaviest concentration of irrigation wells in the world." Depletion of groundwater supplies for irrigation is the principal reason for initiation of the Prairie Bend feasibility study. Stabilized groundwater levels and enhancement of groundwater quality are the promises of the feasibility study for Nebraska.

Why then, has the Bureau not presented in clear terms a Prairie Bend alternative that places primary emphasis on conserving groundwater quantity and quality? Instead, the Bureau has concentrated on expansion of irrigated activity. Stabilizing groundwater levels would come at the price of constructing large reservoirs. Groundwater quality enhancement would only result from possible recharge "dilution" effects.

Quantity. The Bureau estimates there are 257,700 acres in the Prairie Bend project area capable of sustaining irrigation. Of this total, 195,900 acres are presently irrigated. Without any project acreage will diminish due to groundwater depletion, either by outright aquifer dewatering or through increased costs of pumping.

Although it has not prepared a conservation alternative, the Bureau has used several conservation assumptions in its groundwater model. These assumptions include: 1. taking present irrigated acreage out of production up to 50% of the time; 2. limiting irrigation growth to 2% per year; and 3. rotating irrigated soybeans with irrigated corn. With these assumptions, the Bureau can model the effort needed to balance or stabilize groundwater levels (reduce the deficit to near zero). This is expressed in future "irrigated" and "irrigable dryland" acreage.

It is no surprise that taking irrigated acres out of production increases the number of irrigable acres. By using the first assumption in the model, future irrigable dryland acres increase from the present 61,600 to a future102,600. By adding the second assumption to allow continued 2% per year growth in irrigated acreage, irrigable acres are 83,100. Addition of the third assumption requiring a corn/soybean rotation places future irrigable acres back to near-present levels at 62,100 acres.

The second assumption scenario--2% growth and acres out of production--has been selected by the Bureau as the "without project" condition, that condition which is likely to exist in the future if the Bureau's "preferred alternative" is not slected. The "without project" condition is the yardstick against which the benefits and costs of the preferred alternative are measured.

Since the Bureau abhors a vaccuum of irrigable farmland, they have also used the model to calcuate which of their alternatives could reduce the irrigable acres to a minimum. One model run has accomplished this by creating four reservoirs and expanding canal irrigation by 30,000

acres. Only 8,600 acres in the entire project would remain as irrigable. If this run is comparable to the preferred alternative--this appears to be the case--then the rough project benefit is the difference between the value of irrigated and dryland crop production for 75,000 acres. Estimated present costs for this project are $280 million.

The problem with the foregoing discussion is that this tremendous effort might be taken to only make up what presently amounts to an estimated 20,000 acre-foot groundwater deficit. This deficit could, using the Bureau's own modeling, be made up by using the third assumption--rotating irrigated soybeans with irrigated corn. Although acreage reductions would result in selected parts of the project, an expansion of irrigation could be maintained in others. The Bureau has not pressed forward with this analysis to develop a conservation alternative. Apparently this would be accomplished at the expense of calculated benefits for their construction alternative.

Just such a conservation plan has been strongly urged throughout the study process and even presented in a detailed plan by a PVG participant. This effort has been to no avail. Despite early promises, the Bureau has not attempted its own water conservation alternative and has not even forwarded the plan sent to Bureau to the other PVG members.

To the contrary, the Bureau has developed a "without project" condition that, in the opinion of the Water Education Project, overstates the probable impact of groundwater management on irrigated crop production and inflates the projected economic benefits of the Bureau's preferred project alternative.

Quality. Nitrate contamination from agricultural fertilizers has long been recognized as a serious problem through much of the Prairie Bend area. In 1984, nitrate concentrations over a large area between Kearney and Grand Island averaged over 20 parts per million (ppm), twice the national safe drinking water standard, and were increasing by 1 ppm per year.

The Bureau has recognized from the beginning that meeting the groundwater quality objective would be difficult. Several PVG members, including the Nebraska Water Conservation Council, were critical of the Bureau's "slight" treatment of the issue in the Plan of Study. At that time, the Bureau made assurances this would not happen and that alternatives incorporating quality concerns would be developed. Yet, judging from the Bureau's efforts, groundwater quality concerns have been ignored.

Instead, the Bureau has been propagating a myth that recharge reservoirs will reduce nitrate contamination through "dilution" or "flushing." The dilution theory is based on the assumption that by introducing clean Platte River water, the nitrates will be relatively fewer. The flushing theory assumes that introduced waters will move nitrates into live streams, such as the Platte.

The Bureau has made other assumptions worth noting. First, increasing irrigated acreage using clean Platte water and requiring best management practices (BMP's) "should not accelerate water quality problems." Second, "reducing irrigated acreage would reduce the amount of nitrates being lost to the aquifer." The Bureau cautions, however, that acreage reduction must stabilize groundwater levels or else "the net impact on ground-water quality may only be to slow down the rate of deterioration."

The best one could hope for given these theories and assumptions is that BMP's will arrest deterioration and recharge waters will flush it away.

The Bureau's groundwater quality myth is neatly summarized in a recent response to inquiries from WEP:

> "While recharge alone may bring nitrates within public health standards in some local areas, we do not believe that recharge alone will solve all of the nitrate problems in the Prairie Bend area. Likewise fertilizer management can be expected to reduce nitrates in some areas but it is doubtful that such effort can solve all of the problem. We believe the greatest impact on reducing nitrates is through a combination of fertilizer management and additional recharge."

The Bureau has produced no research, no data, no evidence, no justification of its assumptions, or verification of its theories whatsoever. No groundwater quality plan has been developed. The myth is built on unfounded statements alone.

Conclusion

The Prairie Bend feasibility study presents a tremendous opportunity for serious examination of issues at the forefront of Nebraska's resource policy debate. This demands careful and thorough study from private citizens, interest groups, and local, state and federal agencies and policymakers.

Research by the Water Education Project shows that the Bureau is failing to meet several of the most important mandates of its study mission. More directly, the Bureau has failed to justify the basic need for a Prairie Bend project. Assumptions supporting likely project construction alternatives remain undisclosed. These alternatives reveal an effort to simply retread original Mid-State data and construction features.

The Bureau is sidestepping production of a groundwater conservation alternative. In fact, the Bureau may be inflating project benefits by overstating the impact of potential groundwater conservation measures on area crop production. The Bureau is ignoring groundwater quality concerns.

The public involvement process has almost completely broken down. The Bureau has not provided its Public Values Group participants with meaningful, timely information, impeding substantial public review prior to selection of its own plan. The Bureau's technical advisory groups, an alternative source for citizen information, have been virtually nonfunctional. The Bureau has either forgotten or ignominously shelved public recommendations for groundwater conservation alternatives.

The Bureau's feasibility study is currently about six months behind schedule. While not a problem in itself, the Bureau intends to make up for "lost time" through accelerated review at higher Bureau levels. Coupled with the current public involvement process breakdown, this could further seriously reduce opportunity for citizen objection and suggestions for change in the "preferred" project plan. Accelerated Bureau formulation of the draft EIS could lead to later problems.

This staff report, while critical of the present study conduct of the Bureau of Reclamation, recognizes that Nebraskans may yet see the objectives of the authorized study fulfilled. This can only be accomplished, in our opinion, by a more open and forthcoming relationship by the Bureau of Reclamation.

Water Education Project
Nebraska Water Conservation Council
910 'L' Street, Lincoln, Nebraska 68508 402/476-2060

Staff Report: Prairie Bend Feasibility Study Economics

February 5, 1986

Introduction

This is the second report by the Nebraska Water Education Project (NWEP) on the Bureau of Reclamation's feasibility study for the Prairie Bend Unit. The first report, dated January 14, 1986, was critical of Bureau's study conduct relating to public involvement and its consideration of groundwater quantity and quality needs. The current report examines assumptions used by the Bureau in calculating project economic benefits.

NWEP's research into Prairie Bend stems primarily from concern for conserving groundwater. Nebraska's potential commitment of limited resource conservation dollars to Prairie Bend also warrants NWEP research into the economic soundness of the project. Crop prices and yields are among the most basic of the assumptions influencing project economics.

Background

Bureau study of the Prairie Bend Unit is not new. Its major project components date to the larger Mid-State Unit of the Pick-Sloan/Missouri Basin Program. Mid-State was "deferred" in 1975 due to local electoral opposition. Renewed interest in the project by the local Central Platte Natural Resources District (NRD) led to Congressional authorization of a new Bureau study for the Prairie Bend Unit.[1]

After two and a half years, the Bureau is nearing an important landmark in its feasibility study. In March, 1986, the Bureau's Grand Island office will announce the selection of a "preferred" plan and pass study findings to higher Bureau officials for review. The preferred plan is that with the greatest net economic benefit. In general, a plan must demonstrate economic benefits at least equal to costs.

Certain "Principles and Guidelines" direct the formulation and evaluation studies of major federal water resource development agencies. These were established by the U.S. Water Resources Council pursuant to the Water Resources Planning Act of 1965, as amended.[2] A key principle is that "alternative plans are to be formulated in a systematic manner..." Among the important guidelines for Prairie Bend Unit economics are "benefit evaluation procedures" for agriculture, "forecasting" of likely future conditions, and identification of "risk and uncertainty."

The guidelines also state that "planning should include an early and open process...to identify both the likely significant issues to be addressed and the range of those issues." The following analysis by NWEP seeks to raise issues concerning the most basic economic assumptions of Prairie Bend--crop price and yield.

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[1] Public Law 98-63 (97 Stat. 301), July 30, 1983.
[2] Public Law 89-80, amended 42 U.S.C. 1962.

Price

Corn is the principle crop in the Prairie Bend study area. Early estimates by the Bureau indicated that over the last three years, corn amounted to 95.5 percent of the all crops, while soybeans accounted for 3.5 percent, and milo only 1.0 percent.

The Principles and Guidelines specify crop price considerations:

> 1.4.10(b) The general level of prices for outputs and inputs prevailing during or immediately preceding the period of planning is to be used for the entire period of analysis. In the case of agricultural planning, normalized prices prepared by the Department of Agriculture should be used.

and,

> 2.3.3 Evaluation of the impact of water management practices or control measures should consider the following components:. . .(b) Prices. Use normalized crop prices issued by the Department of Agriculture to evaluate NED agricultural benefits. . .

Bureau planning instructions carry out these guidelines. For example, Planning Instruction No. 85-06, November 20, 1984, indentifies information from the U.S. Department of Agriculture (USDA), Economic Research Service, on "current normalized prices for FY85." The FY85 price for "corn for grain" was $3.17 per bushel. The Bureau's Prairie Bend Unit farm budget analysis uses a comparable Nebraska figure of $3.21 per bushel.[3]

At present, the Bureau is utilizing the FY85 price for "corn for grain." However, since the USDA "current normalized prices" are updated each fiscal year, the FY86 prices would appear appropriate. NWEP has written the Bureau several times since the beginning of the fiscal year asking whether they intend to update the analysis with FY86 USDA prices. The Bureau has variously replied:

> "The commodity prices for the next fiscal year have not been received. We do not intend to adjust the benefits analysis when the new commodity prices arrive. . ." (December 20, 1985)

and,

> "The 1985 commodity prices have not been received. There is not time to incorporate these prices in the benefit analysis. . ." (January 29, 1986)

NWEP has forwarded an additional request for a more detailed explanation. In the meantime, a telephone call to the USDA's Economic Research Service on February 3, 1986, yielded a FY86 "corn for grain" figure in their November 12, 1985, report of $2.56 per bushel--a full $.65 per bushel or 20% lower than that the Bureau's office Grand Island intends to be the basis for its March plan selection.

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[3] September 25, 1985, interview with Richard "Mac" Foster, economist, Bureau Grand Island Office.

When NWEP asked about the FY86 USDA prices, the Bureau has replied that acceptance of the report by the Bureau offices in Washington, D.C., was delayed due to a "difference of opinion" with USDA over method of computation. Bureau officials conceded, however, that they had expected the corn prices to be much lower.

Yield

While price assumptions are an important determinant of project benefits, projected crop yields are equally significant. Again, guidelines are specific:

> 2.3.3 Evaluation of the impact of water management practices or control measures should include the following components:. . .(d) Crop yields. Project current yields with average management in the project area to selected time periods. Adjust future yields to reflect relevant physical changes. . . in soil and water management conditions. Increases in yields due to future improvements in technology may be included in the evaluation when realization of these benefits is dependant upon installation of the project.

The Bureau's Prairie Bend farm budget analysis projects yields of 54 bushels per acre for dryland corn and 189 bushels per acre for irrigated corn. This irrigated corn figure is at least 30 percent above current yeilds. These projections were developed using the data from the "Platte River Level B Study." That report, released in 1976, established 1966 to 1970 average yields and projected annual yield increases. According to the Bureau, these yield projections are the "best available data."

NWEP contacted two ASCS offices, Buffalo and Dawson Counties, in the Prairie Bend Unit area. According to ASCS, 1985 corn yield were as follows:

	Dawson	Buffalo
Irrigated	125.5 bu/ac	124.5 bu/ac
Dryland	54.8 bu/ac	55.7 bu/ac

The Bureau has commented that ASCS data have "an inherent bias and are not considered usable for projection purposes." On the other hand, the Bureau has said it uses "good available data wherever possible" because it is beyond their capabilities of time and money to do an indepth study of yield projections."

The Platte Level B 1966 to 1970 data was originally derived from the Nebraska Agricultural Statistics annual bulletins. This data was computer projected, then revised on the strength of local SCS conservationist opinions. To compare, NWEP reviewed the most recent corn yield figures in the Nebraska Agricultural Statistics report. While 1985 yield reports are not due until April, 1984 corn yields were reported as follows:

	Dawson	Buffalo	Hall
Irrigated	144 bu/ac	124 bu/ac	125 bu/ac
Dryland	56 bu/ac	55 bu/ac	65 bu/ac

To reiterate, while the Bureau's Prairie Bend projected yields of 54 bushels per acre for dryland corn is near the current mark, the projection of 189 bushels per acre for irrigated corn is 30 percent above the highest current yields.

Analysis

The foregoing review of Bureau economic assumptions raises two disturbing points: first, the Bureau relied on dated price information when new, lower prices had been established by the Department of Agriculture; and second, the Bureau relied on yield information that is arguably unjustified compared with actual current yields.

The Principles and Guidelines give some direction on these points. With regard to yield, "current yields" establish the benchmark for measuring benefits.

> 1.4.9(b) The forecasts of with- and without-plan conditions should use the inventory of existing conditions as the baseline. . .

Adjustments for future yields are to be based on "soil and water management conditions" while increases due to "future improvements in technology" may be included when these are dependent upon "installation of the project." In any event, forecasting should be grounded in a "likely" future:

> 1.4.9(a) Formulation and evaluation of alternative plans should be based on the most likely conditions expected to exist in the future with and without the plan.

And, where uncertainty cannot be resolved, there is additional guidance:

> Principle 10. Planners shall identify areas of risk and uncertainty in their analysis and describe them clearly, so that decisions can be made with knowledge of the degree of reliability of the estimated benefits and cost and the effectiveness of alternative plans.

In all the material obtained from the Bureau of Reclamation on the Prairie Bend feasibility study to date, there is no such identification of "risk and uncertainty" to enable the public to understand the reliability of estimated benefits of crop price and yield.

Conclusion

The Bureau of Reclamation has failed to carry out its Prairie Bend Unit economic feasibility study under the Principles and Guidelines established for water resource project analysis. By proceeding with knowingly dated and unreliable crop prices and yield assumptions, the Bureau has significantly inflated Prairie Bend project benefits.

In the opinion of the NWEP staff, this benefit inflation amounts to nothing short of manipulation of the data to gain favorable consideration for the Prairie Bend project, that would not be warranted by a more accurate analysis.

Bureau alternative plans should be examined to determine the uncertainty inherent in the crop data and assumptions. Reasonable alternative economic forecasts should be considered before proceeding further with calculations of economic benefits and costs.

* * *

Mrs. BOGGS [presiding]. Thank you. Mr. Bevill had to go out for just a moment.

Mr. COOK. My name is Richard Cook. I am a farmer from Central Nebraska. I belong to an organization known as SOLO. SOLO was organized in 1975 when a water program was being studied. It is known as the Mid-State. SOLO was organized to study the merits of this program, and as a result, the program was voted out.

Seven years later, a new program came into existence. SOLO took a look at it, and they could see that in the seven years the only change that was made was the name. They didn't vote it out because it had a bad name, that didn't have anything to do with it. So, immediately 700 farmers petitioned to withdraw 140,000 acres from the district, saying that it was a bad deal then.

Now, the farmers have four major problems today. One is debt, the other is surplus, the third is nitrates, and the fourth is declining water tables. The NRD sees two of these problems, one is water decline and nitrate problems. They neglect the other two. To take care of water decline, they propose to bring to this area 100,000 acre feet, which will cost $250 million, or to support the debt would be $25 million annually. For each acre foot of water, we would have to have a benefit of $250.

I think it would cash flow about 10 percent of that amount, 10 percent of the amount that would be necessary to keep this debt paid. The extra 90 percent would have to be paid by somebody else. There are only two ways it could be gotten: Either we would have to steal it, or we would have to authorize somebody in authority to tax it away from our friends and neighbors.

SOLO deplores even the idea that somebody else would have to pay for our remaining debt. Now, SOLO drew up a plan between 10:30 and 11:00 o'clock. The plan is simply this: Take one-tenth of the cost for one year, or take the cost for one year, we will purchase all of the land which NRD says will go dry if we don't have it. We will take that for one year, buy the land, take it out of production. This is an alternate way. Take it out of production.

How will this affect us? It will cut surplus, it will surely cut the debt down, and we note the nitrate problem comes as a result of irrigation. We never had it until we had irrigation. But in order to meet our obligations, we would have to irrigate more extensively, use more fertilizer. We are simply saying it takes four years to draw up a plan we have to reject and we, in a half-hour, can make a new one.

I say anyone who threatens my existence can't be my friend. I want to be a friend of everybody, so I would hope they could bring up a plan that would be fair to everybody, that wouldn't hurt anybody, that wouldn't make any special demands on the economy of the country.

I thank you for your time.

[The statement of Richard Cook follows:]

TESTIMONY OF RICHARD COOK
BOARD OF DIRECTORS, SAVE OUR LAND ORGANIZATION (SOLO)

BEFORE THE SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT OF THE U.S. HOUSE OF REPRESENTATIVES COMMITTEE ON APPROPRIATIONS

PRAIRIE BEND UNIT, BUREAU OF RECLAMATION, FY87 BUDGET

APRIL 10, 1986

Mr. Chairman, Members of the Subcommittee:

My name is Richard Cook, I am a farmer from Amherst, in Central Nebraska, and a member of the Board of Directors of the Save Our Land Organization, or SOLO. I am seventy years old, farmed all my life, and learned what I know in the school of hard knocks, the Depression, and hard times. I love the soil, I love my country, and I want to leave the land as good as when I came onto it. What I am doing I do for the future and not for my own personal benefit.

SOLO was orginally organized in 1975 to oppose the MidState reclamation project. The organization is made up of farmers and ranchers in Buffalo and Dawson counties in central Nebraska. Members of SOLO, along with other opposition groups, were instrumental in bringing facts to the voters of the reclamation district who voted to defeat the project. MidState was already authorized by Congress. SOLO was inactive after MidState until September 1982 when we reorganized to oppose the proposed Twin Valley/Prairie Bend project. SOLO circulated petitions in opposition to the propose project and over 700 landowners signed. The petitions said that the signers did not want their land in the project. A total of 140,000 acres, about 55 percent of the land in the Twin Valley district, were signed up by landowners.

SOLO has a board of directors of twelve. Our funds come exclusively from our members. We are working on our own and not as part of a coalition with other interests. All work is voluntary.

SOLO is opposed to further funding from the Congress for feasibility study for Bureau of Reclamation work on the Twin Valley/Prairie Bend project. When the Bureau has spent 40 years studying the project and in only a few weeks farmers can get 140,000 acres signed up to stay out of the project, then spending more money will not get us any more answers.

These farmers signed up not because problems do not exist, but because the project will not solve these problems.

Declining water tables and contaminated water from nitrate are the two major problems. The Bureau's solution to spend around $250 million to bring more water into the project is a poor solution. First, it is economic suicide for those paying the bill. The proposed plan will be to stabilize groundwater levels by brining about 100,000 acre-feet to the district. Using the Bureau's figures, this annual cost will be about $25 million or $250 per acre-foot. We do not know how many acres of land this will benefit, but the Bureau figures show that it will keep about 40,000 acres now under irrigation from going to dryland production. Even if the project benefits 100,000 acres, that is an annual cost of $250 per acre. The annual cost for 40,000 acres would be about $600 per acre.

If a man can extract a nickel out of the other man's dollar, then this would be a benefit to the man with the nickel. The only way this can be done without stealing, is for someone in authority to legally impose this obligation on the man with the dollar. In this case, the man with the dollar is the federal taxpayers. We deplore the concept and cannot support stealing, even if done by legal process.

An alternative to this project would be to rent the irrigation systems out of production and still let them produce dryland crops. This would cost two-thirds less, it will help take care of overproduction, it will stabilize the water table, and reduce the nitrate problem. You could save even more by just buying the land and taking it out of production. SOLO will accept any solution that is economically wise and will solve the problem. This alternative would do this.

Those SOLO members who have petitioned their land out of the district because they may have a canal or reservoir on their land have a self-interest. This is so. But, the majority of SOLO members are not in the areas of physical damage. They believe that the biggest threat to the retention of their land, their resources, and their freedom is debt.

To spend more money with the thought of creating dams and water projects in the Twin Valley/Prairie Bend area would be futile.

Thank you for this opportunity to speak.

# # #

Mr. BEVILL [presiding]. Mrs. Smith.

Mrs. SMITH. Thank you, Mr. Chairman.

I want to say welcome to my fellow Nebraskans. Mr. Cook and I had a nice visit yesterday, and Mr. Cook comes from El Salmo, in the middle of our district and very close to where the Prairie Bend Unit would be.

Mr. Dennis, I don't know where your home is.

Mr. DENNIS. Presently it is Beatrice.

Mrs. SMITH. I see. Well, that is a long way from us. I was very interested in the testimony that both of you brought.

You said, Mr. Dennis, that your organization is a lobbying organization of 5,000 people. How do you get your money?

Mr. DENNIS. The organization started as a door-to-door campaign, and it continues that door-to-door campaign. It is directly meeting the public at the door, receiving a contribution, usually in the form of a newsletter subscription. We consider those people our members.

Mrs. SMITH. I see. Now, I note you say the Prairie Bend study should be significantly expanded. How long do you think it would take to complete this study with all the points you suggest in it?

Mr. DENNIS. I was just over at Interior and did visit with several people at the Bureau of Reclamation. It is my hope, and several of the wildlife interests, we could continue the study within the same timeframe, but that we could make sure these additional items are taken care of. How significant the cost is, I do not know. I am going to try as hard as possible to work with the Bureau to see if we cannot do it within the present costs or with only a minimum amount more.

Mrs. SMITH. Maybe one of you could give me an estimate of how much additional the cost has already been because of the expansion that has already taken place in the study as it was planned.

Mr. DENNIS. That is a good point, Mrs. Smith. The wildlife component of the study has cost two to three times what the bureau originally thought it might.

Mrs. SMITH. Two to three times as much?

Mr. DENNIS. Right. This represents a difficulty in planning any project. We are trying to use the feasibility study to answer questions that go to the Narrows Unit, any further development on the North Platte or South Platte.

As you know, the Platte is very difficult politically; it is difficult as far as the competing interest for water, and if we can use the Prairie Bend process to help us answer questions that go beyond the process, we certainly will try to do that.

Mrs. SMITH. You said two to three times as much money. Could you give us an estimate of how much that has been already?

Mr. DENNIS. I think the wildlife component may have been $100,000 to $150,000. It probably cost upwards of $300,000 or more. A lot of this is undertaken by the Fish and Wildlife Service.

Mrs. SMITH. One more question, Mr. Dennis. Did I understand you correctly when I took part in a meeting in North Platte a few months ago to say you are not against the Prairie Bend project but only that you want a more thorough study?

Mr. DENNIS. That is correct. When we were at the meeting, at the NRD meeting, the point that I raised most specifically was the

bureau could do its economic analysis using current price and current yields, and we think they certainly can do that before coming up with a preferred plan. We are not against the projects. Essentially, there is no project. We do support the study effort because it is producing answers we all need, and we would like to see that continue.

Mrs. SMITH. Thank you very much, Mr. Chairman.

Mr. BEVILL. Thank you very much, both of you.

PLATTE RIVER
WHOOPING CRANE
MAINTENANCE TRUST, INC.

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Tom Bevill, Chairman
Sub-Committee on Water & Energy Development
House Committee on Appropriations
Rm 2362 Rayburn Bldg
Washington, D.C. 20515

April 15, 1986

Dear Congressman Bevill,

This letter is related to the provision of additional funds for the Prairie Bend Unit reclamation project in Central Nebraska. This project is unique in that one of its purposes, as stated in the legislation authorizing the feasibility study, is to provide benefits to migratory bird habitat in the Big Bend reach of the Platte River. The Platte River Trust actively supports the instream flow studies being conducted by the Bureau of Reclamation and the U.S. Fish and Wildlife Service which are a part of the feasibility study. The purpose of these studies is to determine the flow regime required to maintain the migratory bird habitat in the Big Bend reach of the Platte and to develop project operation criteria that will protect and enhance that regime. The instream flow studies underway are listed below. Also provided is a short description of the purpose of each study and the importance of each to the Prairie Bend Unit Feasibility Study. The purpose of this letter is to urge your sub-committee to support the funding needed for these studies and your oversight to see that these tasks are accomplished as a part of the Prairie Bend Unit Study.

1. Verification of the hydraulic simulation model which is being used to predict the depth velocity and water filled channel widths associated with different instream flows. As part of the Prairie Bend wildlife plan the Bureau of Reclamation and the U.S. Fish and Wildlife Service have used a hydraulic simulation model to predict future habitat conditions. While this simulation model has been successfully used in other types of rivers and streams it's validity has not been demonstrated on a sandbed braided river such as the Platte. Before the outputs from this model can be accepted its application to the Platte River must be verified.

2. Development of a sediment transport model that can be used to predict the flows required to maintain the braided river channels characteristic of the Platte. The unique migratory bird habitat of the Platte is, in part, a result of the braided character of the river. Braided river channels are a function of the size of sediments found in the channel, the slope of the channel, and the discharge or flow of water. Generally speaking, braided river channels are

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dependent on periodic high and low flows which alternately scour and fill different portions of the active river bed. Reducing flows, such as will occur with the Prairie Bend Unit, may reduce or eliminate the scouring flows. If this were to occur the braided character of the channel would be lost and the river would flow in a narrower and deeper single meandering channel. If such a change were to occur, the migratory bird habitat of the Platte would be destroyed. A sediment transport model will help us determine if more water can be removed from the river without destroying the braided channel character needed to maintain migratory bird habitat.

3. Develop species habitat model for the Whooping Cranes, Sandhill Cranes, Interior Least Terns, Piping Plovers, Bald Eagles, Ducks and Geese. To determine the quantity and quality of migratory bird habitat associated with different river flows predicted by the hydraulic model described in Item 1 it is necessary to construct models that describe the needs of individual species in relation to instream flow habitat parameters. These parameters include channel widths, water depths, and velocities and characteristics of nesting and feeding sites. Without these models the work described in Items 1 and 2 have very little value.

4. Develop a daily flow management model that can be used to predict the impacts of various proposed water projects (such as the Narrows project on the South Platte River) and the impacts of Prairie Bend Unit wildlife and irrigation alternatives. Management of the Platte River, its tributaries and the many existing and proposed water projects located on it is a very complex problem. To understand how various water diversion and instream flow maintenance scenarios may effect one another it is necessary to use a model. Such a model must be able to predict the daily flows in the reach of the river used by migratory birds. Preliminary reviews of different management alternatives can be examined using a monthly flow model. However, monthly flow models will always overstate the amount of water available for maintaining instream flows and overstate the amount available for diversion. Therefore a daily flow model must be used to fine tune the management scenarios developed with the monthly model. The area covered by the model is dependent on projects to be managed. If the Prairie Bend Unit is the only project being considered in the analysis a daily flow model that covers the area from Overton NE downstream to Duncan will be adequate. However, if the management scenario that describes future conditions includes any additional upstream development, such as Narrows, Corn Creek or Deer Creek, then the daily flow model must be extended upstream to at least Julesburg, Colorado and Lewellen, Nebraska. The logic of this is quite simple; if the river from Overton to Chapman is to be managed to meet a daily flow criteria, a daily flow model is needed to develop flow management criteria for the Prairie Bend Unit. If historic flows, on which the prediction of future conditions are based, are not predicted to change then a daily flow model for the Overton to Chapman reach is all that is needed. However, if the historic flows might be changed by new upstream developments then a daily flow model that predicts those changes is necessary because you cannot legitimately use monthly flow data as input to a daily flow model. Since the States of Colorado and Nebraska both plan a future with increased diversions, the future with Prairie Bend cannot be adequately predicted without a daily flow model. It is recognized that the accuracy of a daily flow model may be questioned. However, that is a matter of concern for both the diverter and the instream flow advocate. If we are unable to predict the availability of water for instream flows we will also be unable to predict

the availability of water for irrigation. The present alternatives proposed for the Prairie Band Unit may cost as much as $400,000,000. Before such a sum is committed the availability of water should be examined with the best tools available.

Thank you for considering this request. If additional information is needed please contact me.

Sincerely yours,

John G. VanDerwalker
Executive Director

JGV:drn

CC: Congresswoman Virginia Smith

THURSDAY, APRIL 10, 1986.

WATER RESOURCE PROGRAM

WITNESS

CHARLENE DOUGHERTY, DIRECTOR OF LEGISLATION, NATIONAL AUDUBON SOCIETY

Mr. BEVILL. Charlene Dougherty. We are always delighted to hear your testimony. You may proceed as you wish. Your statement will be put in the record as is.

Ms. DOUGHERTY. Thank you very much. It is a pleasure to be here. I am Charlene Dougherty, Director of Legislation for the National Audubon Society.

We have concerns about a large number of projects. I have confined my prepared statement to comments on three projects, Bureau projects: the Garrison diversion unit, Prairie Bend and Cliff Dam. I would just like to go over the highlights of these projects in the time allotted.

The first is Garrison. I would like to thank this subcommittee, in particular, for all the support you have provided over the years, as we have tried to bring the Garrison controversy to some resolution. You were supportive of the establishment of the Garrison Commission, which looked at alternatives to the project, and last year you were supportive of putting a time limitation in the appropriations bill with regard to the Garrison appropriation. The time limitation, as you recall, was you appropriated money for the project, but put a restriction on spending for the project pending enactment of legislation in formulating Garrison and set a March 31st deadline of this year for the enactment. That deadline has come and gone, and we have yet to enact a bill reauthorizing the Garrison project.

I will say, after a year of very intense, sometimes acrimonious, and certainly always interesting, negotiations with the State of North Dakota and the various conservation interests, we have agreed on a compromise to the Garrison project, and that is now embodied in H.R. 1116, which was reported from the House Interior Committee just prior to the Easter recess. It is a compromise. It is a very fragile compromise, but we are all pleased, after decades of debate, that we could reach a compromise.

It basically scales the project down, it deauthorizes nine out of 10 of the irrigation acres previously authorized, it changes the emphasis from an irrigation project to primarily an industrial water project for the State of North Dakota. The deauthorization of the project alone takes half a billion dollars off the total cost of the Garrison project. I think we are all realistic to know in the state of Gramm-Rudman this compromise package might face serious problems on the House floor. Enactment of the compromise is by no means certain. We do our parts, but times are difficult for the large water projects. You will probably be more aware than I.

Because we don't have a bill reformulating Garrison at this point and because if we don't change Garrison at the end of this year, we go back to the original authorized project, which is a project Audubon has always opposed, we are not supporting any appropriations for the project at this time. If we do enact the compromise legisla-

tion, then we would be pleased to support appropriations. Our problem is right now we don't know what we are appropriating for, the new project, the old project or some variation of that project.

The administration has requested $18 million for the project. Part of that money is for shutdown activities and part of that money is for construction. We would ask the committee appropriate what is needed for shutdown activities and all, keep our minds open, and if there is enacted legislation perhaps later this year on some vehicle, we could move for appropriations for a newly formulated project. But we are feeling we are caught in an awkward position right now, since the legislation has not moved forward and its days ahead in Congress could be a bit rocky.

We have made progress, and I appreciate the committee's support and patience with us.

Just a couple of quick words on Prairie Bend. I had the great pleasure of visiting the State of Nebraska a couple of weeks ago. Audubon owns and maintains a sanctuary on the Platte River near Kearney, Nebraska, and the migration of the Sandhill cranes occur at this time of year. It is truly one of the wildest wildlife spectacles in all of North America. It is an overwhelming sight.

The problems Mr. Dennis and the man who accompanied him outlined on the Platte are problems we concur with. It is a river over-committed at the present time. It is at about 30 percent of its historic flow, and only about 10 percent of the original habitat for these birds and migratory water fowl remains.

We haven't taken a position on Prairie Bend. As Mr. Dennis said, we don't know what the project is going to look like. We are all eagerly awaiting the bureau's recommendation for that project. We would like to see the committee appropriate the study monies the administration requested for this project, but we really would like, if you could, in the report or in the legislation, to provide some direction to the bureau and ask the bureau to do some of the environmental benchmark studies that we feel are necessary before we would take a position on a project where we feel we can design a project.

There is a lot of data that is missing, and with Prairie Bend, we are in a fortunate position where we are at the beginning of a project, we are not 40 years into a controversy, the sides haven't been chosen, and we are not trying to balance it out. We are trying to work out something at this point, and study money would be very important as long as it was directed toward the right kind of studies, and we would be happy to work with the subcommittee on the kind of language directing the bureau that would, I think, give us the studies that we want within a very reasonable period of time.

I may have run over my time.

[The statement of Charlene Dougherty follows:]

National Audubon Society

NATIONAL CAPITAL OFFICE
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TESTIMONY OF CHARLENE DOUGHERTY

DIRECTOR OF LEGISLATION

NATIONAL AUDUBON SOCIETY

BEFORE

THE SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

HOUSE APPROPRIATIONS COMMITTEE

April 10, 1986

Thank you for the opportunity to appear before you today. I am Charlene Dougherty, Director of Legislation for the National Audubon Society. The National Audubon Society is one of the nation's oldest and largest conservation organizations, with over one-half million members and 550 chapters nationwide.

While National Audubon has concerns about a number of water projects and related resource issues, I will confine my remarks and statement to three Bureau of Reclamation projects of immediate concern: the Garrison Diversion Unit in North Dakota, the Prairie Bend Project and related developments along the Platte River, and Cliff Dam, a component of the Central Arizona Project.

Garrison

This committee has been very supportive of efforts to achieve a compromise resolution to the Garrison controversy. In 1984, you agreed to a provision on the FY85 Energy and Water Appropriation bill creating the Garrison Commission. The commission, as you recall, was charged with developing recommendations for an alternative to the authorized project -- an alternative which provided for the contemporary needs of the State of North Dakota and which reduced the project's environmental and international impacts.

The final report of the commission was transmitted to Congress in December 1984. It forms the basis for legislation recently reported from the House Interior and Insular Affairs Committee (HR 1116, a bill reauthorizing the Garrison Diversion Unit) and now awaiting House floor action. The Garrison Commission found that the most pressing water resource development need in North Dakota was for municipal, rural, and industrial (MR & I) water supplies. A large portion of North Dakota's citizens simply do not have adequate and reliable supplies of safe water. Accordingly, the commission recommended an alternative project emphasizing MR & I development and substantially scaling-down the irrigation acreage.

Translating the commission's recommendations into legislation upon which the major parties to the Garrison controversy could agree upon turned out to be a formidable undertaking. This committee recognized the difficulty and last year included language in the FY86 Energy and Water Appropriations bill conditioning availability of most of the FY86 funds for the project upon enactment, by March 31, 1986, of legislation reformulating Garrison. The March 31 deadline has passed and legislation reformulating Garrison has not yet been enacted.

The Administration has requested $18 million for Garrison in FY87. Part of the $18 million is to be used for project shut-down activities and part of the funds are to be used for some construction activities. Legislation reformulating Garrison has not been enacted, and legislation recently reported by the Interior Committee appears to have a long and difficult road ahead. Therefore, the National Audubon Society cannot, at this time, support the appropriation of any funding for the project except those funds specifically required for project shut-down. We do not know nor can we predict if the reformulated project will be approved by the Congress. If it is not approved by this Congress, the authorized project -- the old Garrison with all of its environmental and international problems -- remains "on the books." If funds are made available at this time, and if Garrison is not modified by Congress, the Secretary of Interior could resume building the old Garrison project, a result we would fervently oppose.

We support the legislation reported by the Interior Committee reformulating Garrison. If HR 1116 is enacted without substantive change, we will then support funds for construction of the project authorized by that bill.

For the past year, Audubon and other conservation interests have been engaged in lengthy and difficult negotiations with officials representing the State of North Dakota and North Dakota water development interests. It has not been an easy process for any of the parties. Our objectives were to develop a compromise plan which we could all support and to end the historic feud we have waged over this project. In other words, we tried to make peace and begin to work together to provide North Dakota with a sensible water resources development program and to protect its very special wetlands and wildlife resources.

An agreement was reached just a few weeks ago. Part of the agreement is contained in the text of HR 1116. The other part of the agreement is a pledge that we all will work together to get the legislation enacted by this Congress and that we -- the parties to the agreement -- will not agree to any substantive changes to the bill. The compromise is a fragile one, consisting of a careful balance between competing concerns and interests which could easily unravel.

We all recognize, too, that times are changing in Congress with regard to approving the construction of large water projects. The legislative road ahead -- the House floor and Senate consideration -- may well be difficult and controversial. It may be that in spite of our best efforts, the legislation will either not pass the Congress or it will be so altered that the parties to the compromise can no longer support it. We sincerely hope this is not the case. We would like to take this opportunity to urge you to support HR 1116 when it comes to the House floor in several weeks and appropriate funds for the project if and when HR 1116 is approved by the entire Congress and signed into law .

From a water development, environmental, and fiscal standpoint, the project authorized in HR 1116 is a vast improvement over the old Garrison project. A few highlights seem to be appropriate. The committee bill deauthorizes more than 900,000 acres -- almost 9 out of 10 acres -- from both the 1944 and 1965 authorizations; it locates irrigation outside the Hudson Bay drainage, thereby addressing some of the major Canadian concerns; it requires that Lonetree Valley be managed for wildlife purposes; it protects the unique Kraft Slough by making it a National Wildlife Refuge; it provides a municipal rural, and industrial water supply program for the state; it requires the execution of new repayment contracts prior to start of construction of major new features thereby tightening up the repayment of reimbursable costs to the government; it sizes-down certain project features so that dollars will no longer be spent to build oversized facilities; it imposes a penalty on irrigators using project waters to grow surplus crops; and it provides for better wildlife and wetlands protection through improved mitigation procedures and the establishment of a wetlands trust. Special concerns raised by citizens in North and South Dakota about impacts of the new project on the James River will be addressed through a special, in-depth study to be conducted by the Department. No construction directly affecting the James River will go forward until completion of the study.

From a water development standpoint, the compromise fully recognizes and provides for the present day needs of the State. From an environmental standpoint, there are some benefits in substantial reduction in irrigation development and important added wildlife protection measures. From a cost standpoint, the compromise is admittedly expensive, but is far less costly than the original project. Nearly one-half billion dollars in potential project costs are saved by the deauthorization of irrigation alone. And Canadian objections to irrigation on the Hudson Bay watershed are addressed, helping to defuse an awkward problem creating friction in US/Canadian relations.

As I am sure you will agree that it is unusual for developers, the conservationists, and other interested parties to get together and work out an agreement of this complexity -- especially over a project of such long-standing controversy. You and your committee played an important and constructive role in bringing about this result for which we commend and thank you.

Platte River

The National Audubon Society is deeply concerned about water development along the Platte River. This river provides habitat for the Whooping Crane, Bald Eagle and Least Tern, all endangered species, and for the Piping Plover, a threatened species. More than one-half million Sandhill Cranes stop along a short stretch of the Platte for a few weeks each spring during their migration from the Gulf Coast to breeding grounds in northern Canada, Alaska, and Siberia. This is the largest congregation of cranes in the world, providing an amazing wildlife spectacle (which draws tourists in ever increasing numbers from all parts of the globe). In addition, millions of ducks and geese and several hundred different species of other migratory birds use the Platte River each year.

The Platte provides very specialized habitat to these birds. Cranes, for example, must have wide stretches of shallow water, preferably with bare sandbars to roost free of predators, and adjacent wetlands and fields for feeding. The cranes use the Platte River habitat each spring to feed and acquire the necessary nutrients and weight to make the long journey to their breeding grounds. The small remaining area of suitable habitat is crucial to the continued survival of not only the Whooping Crane, but to the sandhills as well.

The Platte, however, is a river under extreme stress. Substantial development has already occurred. The river is now at 30% of its historic flow; it has been so channelized, developed, and regulated that wildlife habitat has been reduced as much as 90%. Development of even a portion of the proposed additional projects -- private and federal -- could easily use up the total remaining flows in the river. A zero sum situation has been reached on the Platte where each additional increment of development creates disproportionately large losses of the non-development amenities of the river -- to fish, wildlife, recreation, tourism. Any new development or changes in the present management and use of the river cannot be made in isolation; cumulative impacts of projects, existing and proposed, up and down the river must be evaluated and considered as decisions on individual new projects are made. Solid and current scientific data assessing these impacts must be available and made part of the decision-making process before irreversible committments are made and irreplaceable losses occur.

Key to protecting the Platte River for all of its many uses -- including providing for water supplies for cities and communities, for the cranes and other wildlife, for tourism, and for irrigation -- is the determination and maintenance of adequate instream flows. The current situation, even absent of new project development, must be improved in this regard because habitat is continuing to deteriorate and wildlife resources are declining. Instream flows take on added urgency because of the number of proposed projects and project-related activities occuring on the Platte. The information required to determine adequate instream flow levels to maintain and improve the Platte River resources needs to be developed and developed soon.

Of most immediate concern to this committee is the Administration's request for $400,000 for continuation of a feasibility study for the Prairie Bend Unit. The Bureau has indicated that it will annnounce its preferred alternative in May of this year. But it is currently operating in a major information vacuum. The Bureau does not have the scientific data it needs, nor has it completed the additional studies which it must have to make a reasoned decision about what kind of project is appropriate, if any, or the impacts of such a project.

We are not opposing the appropriation of money for continued studies, but we are asking this committee to provide clear direction to the Bureau about how that money should be spent. Because the Bureau seems embarked upon a course of action to do the engineering and develop a project design before the benchmark environmental studies are done -- and in some cases before they are even begun -- we are forced to ask the committee to direct the Bureau to postpone further work on a specific project design now and instead to develop the data we all need to make decisions concerning future development of the Platte. Accordingly, we ask that you instruct the Bureau to use this appropriation to -- at a minimum -- verify the hydrologic models for the Platte; develop species models for the various wildlife dependent upon the Platte, including the Whooping and Sandhill Cranes, Bald Eagles, Least Terns, Piping Plovers, waterfowl, and various fish; to develop daily flow models for the Platte from Lewellen (N. Platte) and Julesberg (S. Platte) to Duncan , and to develop a sediment transport model. Further, it is our understanding that the Fish and Wildlife Service may be unable to carry out its present obligations to do Platte River studies because the Bureau is providing insufficient funding. The funds needed by FWS to do its research work on the Platte, including the additional studies we are recommending, should be made available by the Bureau from this appropriation.

Finally, it is critical that the studies done in connection with Prairie Bend not be done in isolation from the other investigations and work being done on the Platte. We cannot emphasize enough that decisions made with regard to the Narrows project and the FERC relicensing at Lake McConaughy and the decisions concerning Prairie Bend are interrelated. One cannot be done in isolation from the other; all impact each other. To date, there is a lack of coordination. We urge the committee to insist that the river be looked at, studied, developed, and protected in a unified way. This can be achieved, in part, by directing that some of the funds for the Prairie Bend study be used for coordinating this study with the Platte River Joint Management Study.

There are a number of important decisions to be made in the near future which will determine the very existence of the Platte and its tremendous resources -- wildlife and otherwise. We must not let these decisions slip away from us by default -- by focusing so much on individual projects that we lose sight of what is really happening up and down the river. By pushing ahead on Prairie Bend, the Bureau is forcing us into a confrontational mode. We do not want that , nor I am sure, do you. We are urging that this committee defuse the time bombs ready to go off on the Platte and insist that the critical studies and information be developed before major decisions affecting Platte River flows are made.

CLIFF DAM

The proposed Cliff Dam project on Arizona's Verde River is one of the most environmentally and economically costly components of Plan 6 of the Central Arizona Project. Construction of Cliff would not only place an unfair burden upon federal taxpayers, but would destroy an ecologically unique segment of free-flowing river and adjacent stream habitat. Fifty miles of riparian land surrounding the site would be destroyed or severely degraded by project construction, an area that provides prime habitat for four of the thirteen known breeding pairs of endangered desert-nesting Bald Eagles.

The Bureau of Reclamation claims that Cliff would provide Arizona residents with needed flood control and water storage benefits. However, analysis of this assertion discloses that the motive for construction of Cliff is not flood control. The Bureau of Reclamation itself acknowledges that other alternatives that are available. Cliff Dam is, rather, a project that would make available thousands of acres of land for commercial and residential development in Phoenix. A federal subsidy for this type of development in one of the nation's most prosperous and fastest developing regions is incomprehensible. As for the need for water storage, the proposed Rio Salado Development District associated with the project would actually consume more water than is made available by the dam.

The Bureau of Reclamation has requested $326,000 for FY87 for such preconstruction activities as associated with fish and wildlife studies and potential mitigation procedures. We oppose this appropriation, as construction of the project would be environmentally objectionable under any circumstances. This is one of those situations where the environmental losses simly cannot be mitigated. Further, Cliff Dam is not a necessary part of the Central Arizona Project and simply does not need to be built. Accordingly, any expenditure of funds for any purpose relating to Cliff Dam is a waste of money.

Another aspect of the Cliff Dam and Plan 6 funding troubles us deeply. Last spring, the Department of Interior announced that it would be using funds from the Federal Reclamation Dam Safety Program to carry out needed dam safety work in Arizona. While we applaud the purposes of the dam safety program, in our view the Bureau is abusing its authority under that program. Specifically, the Department has announced that it intends to spend funds from the dam safety program for the construction of a new dam, Cliff, as part of its safety work. Both the law and the legislative history prohibit the use of dam safety funds for the constructiuon of new features. The department has attempted to defend its intention to use dam safety funds for Cliff, but its defense is woefully weak. We think the legislation history of the Dam Safety Act is clear. Its funds are to be used to repair and strengthen existing dams, not to build new ones.

We would suggest that this committee may want to carefully examine the Bureau's use of its dam safety funds. Building Cliff Dam with dam safety funds, in our view, is simply another tactic to construct the Central Arizona Project on a fast track, and in so doing, divert funds away from other more deserving projects. Thus, in addition to requesting that you not appropriate funds for preconstruction activities associated with Cliff, we would also ask you to direct the Bureau to not spend dam safety monies at all on the proposed Cliff Dam.

We appreciate the opportunity to appear before your committee. We will be pleased to provide any additional information you need about these projects.

Mr. BEVILL. All right. I would think those cranes are coming in there to get that good Nebraska corn, aren't they?

Ms. DOUGHERTY. They are coming in to get the good Nebraska corn. The cranes have a very peculiar habitat need. They like a wide, shallow river with very little vegetation around it, and they sleep overnight standing up in the river to watch out for the predators. So what is important for us with regard to the river is that a sufficient flow be maintained in the river so that the habitat scarring that needs to take place takes place and that there is the kind of place for the cranes to roost.

If you look at the patterns of the cranes, you see that in the winter they flock along the Gulf Coast and Mexico, they migrate north to just a very tiny little part of Nebraska, and they they go on to Siberia and Alaska. But the good Nebraska corn is what makes their continued existence possible.

Mr. BEVILL. We are reminded by Mrs. Smith of the good Nebraska corn. That is why I immediately thought of it.

Mr. MYERS. You don't raise wheat anyway.

Mrs. SMITH. We have raised a lot of wheat.

If I may make a comment, let me say I saw the cranes, and they are a great sight. Mr. Chairman, they eat enough corn to gain three-quarters of a pound, enough to carry them on up into the Arctic on their flight, and I think you will be interested in studying more about the plans for the Prairie Bend project, and you will be much interested that it plans for much improvement in the wildlife habitat over what we have now. That is all, Mr. Chairman.

Mr. BEVILL. Any other questions?

Thank you very much.

Mr. RUDD. Mr. Chairman, I have a question.

Mr. BEVILL. Mr. Rudd.

Mr. RUDD. I didn't hear you address Cliff Dam.

Ms. DOUGHERTY. I was running out of time.

Mr. RUDD. I see you have a statement here regarding Cliff Dam, indicating it need not be built, it is a waste of taxpayers' money. Would you enlarge on that for a moment?

Ms. DOUGHERTY. Our position is there is a request in the administration's budget for study money for Cliff Dam. At the time when the decision was made not to build Orme Dam, the bureau was directed to come up with a suitable alternative, and it considered approximately nine alternatives, and one of those alternatives was an alternative which did not include the Cliff Dam configuration. And it would have provided benefits to the Phoenix and downstream areas.

Our position on Cliff Dam is that it is a waste of money to study the wildlife impacts of Cliff Dam. We know what those impacts are. We don't believe those impacts can be mitigated and that there is no point in studying it any more. The point would be, let's look at some other configuration of that whole plan six or plan nine, or whatever, that we can get on with the work without building the Cliff Dam.

Mr. RUDD. Have you been there?

Ms. DOUGHERTY. Yes.

Mr. RUDD. How much money has the Audubon Society spent on your study of Cliff Dam?

Ms. DOUGHERTY. We have not done a study. The Fish and Wildlife Service has studied Cliff Dam. The local Audubon Society, which will be represented here later today, may have spent money on it. The National has not spent money on a study of Cliff Dam.

Mr. RUDD. Let me provide you with some additional information that might be of help to you. In the first place, the Bureau of Reclamation was not directed to find an alternative, but the Governor of the state decided, because there was some opposition to Orme Dam, that they should study some alternatives and came up with some alternatives, and plan nine was thoroughly looked at, which is the basis of a lawsuit that your organization and several others have joined to stop this dam on a national level.

Ms. DOUGHERTY. Yes.

Mr. RUDD. You say it is not justified and not needed and a waste of taxpayers' money, but you don't say why.

Let me give you a little bit of history. You know, I have a study available that goes back 170 years on the flow of water in the Salt River. We have had years of extreme droughts and extreme wet years. In 1970, for example, in that vicinity, over four million acre feet of water came down the river, which would be enough to wipe out the entire community of Phoenix and all environs if it were not impeded in some way or other, or controlled. And, by the same token, we have had years where only 300,000 acre feet of water came down there several years.

As a result, there was a drought in the turn of the century, and half of the population moved away. But we who are involved with government have a responsibility to the citizens not only of Arizona but for the entire nation. And water is the most vital resource that we any of us citizens in this America, have.

Due to the wide flow of water that comes down the river, we had to make some adjustments, and because people opposed dams around the turn of the century, nothing was done. But a few people decided when half of the population moved away that we should do something, and that is why Roosevelt Dam was built in the first place and a sophisticated network of dams and rivers which have provided livelihood and provided the West and Arizona, in this particular instance, with a development that has benefited, in terms of many billions of dollars, the entire nation.

Cliff Dam was taken as an alternative simply because people didn't decide Orme should be built. This was a place for a regulatory storage dam, holding dam, to be built.

I have seen a lot of figures that you have provided indicating that there isn't a lot of water storage behind Cliff and that it doesn't have anything to do with flood control. But, to the contrary, let me tell you that there will be stored behind Cliff Dam 200,000 acre feet of water, which would be usable water for you and I, if you lived there, to drink and to use in beneficial ways.

Because Orme Dam was stopped, it became necessary to have a regulatory storage dam, which was the Waddell Dam, and it became necessary to think about doing something about Roosevelt Dam well up the Salt River Valley for additional storage and for potential flood control in view of what could happen with the tremendous floods that do come down the river, and it was necessary to build Cliff Dam in order to help that along for the benefit of the

citizens of not only Arizona, and not only of the Valley, but of the entire country. So Cliff Dam is a vital segment to this.

Indicating that we don't need the water is just not accurate. We have the right to offer two million acre feet of water to come in from the river, but the simple Arizona project will be the last one on line to have this water if there is a drought on the Colorado River, and these droughts on the Colorado River equate the droughts that come in on the Verde and Salt Rivers and flowing into the Gila River, so that in times of drought we wouldn't have the simple Arizona water project available.

And let me tell you that even though the mean acreage, water acreage that comes down the river is one million acre feet a year, over the long haul, 170 years, we can't get along on 3,000 acre feet of water, 300,000 acre feet of water, and we use all of that just for the people who live there.

In 1980, the population was 1.57 million people in the entire Valley there depending on this water. And the project projection by the National Census Bureau indicates that we will have maybe 4.1, two or three million acre feet of water there in the next 14 years or less, by the year 2000. So it is the responsibility of the people who have been elected and who have been appointed to serve the people of Arizona, to look to the future a little bit for water. Those are the reasons that we should have Orme Dam, and we are not going to have Orme Dam, but we are going to have to have Cliff Dam.

I will tell you, as a matter of fact, if Orme Dam had been built—not Orme Dam, because it will never be built, but if it had been put together, it could conceivably have contributed about 2.3 million acre feet of water to the benefit of the community during times of drought and would have caused no problem for any of the environment.

I don't know how much money your organization may have been spending on benefit to the environment, but we have spent $30 million to help the environment and to satisfy the needs of the environment along the aqueduct, and the State of Arizona has reasonably allotted $2 million. That is a lot of dollars to assure the Bald Eagle you were talking about and are concerned about will be adequately cared for.

I just tell you that so it might be of interest to you in order to perhaps look at your own facts with regard to this and see if that might change them somewhat.

But I thank you very much for your testimony.

Mr. BEVILL. Any other questions?

Thank you very much.

APR 17 RECD

National Audubon Society
NATIONAL CAPITAL OFFICE
645 PENNSYLVANIA AVENUE, S.E., WASHINGTON, D.C. 20003 (202) 547-9009

April 11, 1986

The Honorable Thomas Bevill
Chairman, Energy and Water Subcommittee
House Appropriations Committee
Rm. 2362 Rayburn House Office Bldg.
U.S. House of Representatives
Washington, D.C. 20515

Dear Chairman Bevill:

The attached statement was sent to us from a cit. a's group in Arizona who requested our help in transmitting it to the committee for inclusion in the hearing record of the FY87 Energy and Water appropriations bill.

We would greatly appreciate it if you could include the statement of Citizens Concerned About the Project (Central Arizona Project) in the hearing record.

Thank you for your time and cooperation in this matter.

Sincerely,

Lise H. Aangeenbrug
Staff Assistant

Citizens Concerned About the Project

P.O. Box 2628 • Phoenix, Arizona • 85002

April 1986

To: Chairman, Appropriations Committee

From: Dave Campbell, Chairman, CCAP

Re: CAP and Bureau of Reclamation Budget Requests

Mr. Chairman and Members of the Committee

With all the rhetoric about the deficit and the need to reduce federal spending, we were amazed to hear the Administration ask for a substantial increase in funding for the Central Arizona Project (CAP). Surely the facts do not support a need for this project in any foreseeable future. An honest economic appraisal at a realistic interest and discount rate shows it to be a waste of tax dollars. As was pointed out in our testimony last year, the CAP will return less than 35 cents for each tax dollar invested in it.

That many others are concerned about wasteful water projects is shown by the enclosed reviews of our Executive Director Frank Welsh's book "How to Create a Water Crisis" by such diverse publications as Audubon and Civil Engineering magazines and the Journal of Agricultural Economics. My favorite review is from "Choice," one of the 3 leading library review journals in our nation: "He makes a stunning case that the real welfare queens in America are the irrigators of the West."

I have also enclosed a review by Professor Leshy of Arizona State University Law School. He astutely perceives that the book "typifies an emerging phenomenon, the marriage of the fiscal conservative and the environmental activist." While he considers the book's major conclusion, to abolish the Bureau of Reclamation, not politically feasible, we are finding increasing support for the concept.

The President's budget request provides a wonderful tool to help us sell this concept since he increases the Bureau's budget while decreasing National Park's and Fish and Wildlife's. This illustrates that those who threaten our national treasures are in control of the Interior Department and helps us point out how important it is to get the Bureau Fox out of Interior's henhouse.

As a citizens taxpayer group, we strongly urge that you not only not increase funding for the Bureau of Reclamation but rather greatly decrease their appropriation. Here is one area where domestic spending can be cut without impacting the truly needy. We suggest most of the reduction in the President's request come from money slated for the truly unnecessary CAP. We also caution Congress about the sweetheart agreement being negotiated between Arizona and the Secretary of Interior. This would give the CAP approximately $200 million a year for the next 10 years!

THURSDAY, APRIL 10, 1986.

PHOTOVOLTAIC PROJECT

WITNESS

JOHN A. VANCE, WASHINGTON COUNSEL, PACIFIC GAS & ELECTRIC COMPANY

JOHN A. OSTROM, PROJECT MANAGER, BECHTEL POWER CORPORATION

ROBERT A. TRAVERSO, ASSISTANT CITY MANAGER, CITY OF DAVIS, CALIFORNIA

Mr. BEVILL. Dr. John Vance.

Mr. VANCE. Thank you, Mr. Chairman, and members of the committee. I am John Vance, Washington Counsel for Pacific Gas & Electric Company. Before I begin my summary, I would like to introduce representatives of two of the partners in the joint endeavor I will discuss. On my left, John Ostrom of the Bechtel Power Corporation; and Mr. Robert Traverso, Assistant City Manager of the City of Davis, California. Each will have a brief statement.

Pacific Gas & Electric appreciates the opportunity to testify on the matter of new energy supply options, which is not only a challenge to the utility industry but our nation as well. To meet this challenge, we are asking the committee's support for a proposed solar power research and development project of a size appropriate for utility scale application. It is referred to as "Photovoltaic for Utility Scale Application, or PVUSA, and it will add to our capability to provide a least-cost service to our customers.

The company has sent a proposal to the Department of Energy requesting a 50 percent Federal cost sharing. The proposal meets the administration's guidelines for cooperation and partnership between industry and government in support of long-term applied technology development. We are not requesting appropriation of new funds. Funds we request are those the Congress has earmarked for utility photovoltaic systems that have not been expended.

PVUSA, as proposed, is a cooperative project involving not only Pacific Gas & Electric but with co-funding by the Department of Energy, the California Energy Commission, the Electric Power Research Institute, other utilities and the photovoltaic industry.

On the utility scale, application has a market throughout much of the United States and many foreign countries, particularly those with vast amounts of sunshine and little existing energy capacity. We feel it is in the best interest we not forfeit to other nations the development of this technology.

Thank you, Mr. Chairman.

Mr. BEVILL. Thank you.

[The statement of John A. Vance follows:]

TESTIMONY OF

PACIFIC GAS AND ELECTRIC COMPANY

BY

JOHN A. VANCE, WASHINGTON COUNSEL

U.S. HOUSE OF REPRESENTATIVES
SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT
COMMITTEE ON APPROPRIATIONS
WASHINGTON, D.C.

PHOTOVOLTAICS FOR UTILITY SCALE APPLICATIONS
APRIL 10, 1986

Mr. Chairman, Pacific Gas and Electric Company (PGandE) appreciates the opportunity to testify before this Subcommittee. PGandE has sent a proposal to the U.S. Department of Energy requesting 50% federal cost sharing of a major new photovoltaics research project, which we call "Photovoltaics for Utility Scale Applications" or PVUSA. We request the Subcommittee's support for the project, and your help in obtaining federal funding.

PVUSA meets the Administration's guidelines for cooperative partnerships between industry and government in support of long-term applied technology development. PVUSA also represents a highly effective use of the funds that Congress has already earmarked for utility scale photovoltaic systems. These funds, intended for Phase III of the DOE's cost shared project with the Sacramento Municipal Utility District (SMUD) were not expended, because of SMUD's withdrawal from the project. Thus, we do not ask that PVUSA be supported as a substitute for on-going photovoltaics research efforts. What we do ask is that on-going research be aggressively supported and that provisions for federal cost sharing of the highly complementary PVUSA project be established.

PGandE is requesting 50% cost sharing from DOE for a project that is needed by the U.S. utility industry, the U.S. photovoltaics (PV) industry and the national PV research program.

During its 10-year lifetime, the PVUSA project will consider all current and emerging PV technologies in a two-phase program employing utility-scaleable test beds at two sites, one with typical direct and one with typical diffuse insulation characteristics. By completion in 1995, the project will have installed power generating segments with a capacity totaling 10 MW (peak) and will have identified those PV technologies ready for commercial power plant demonstration. The cost for both project phases is estimated on the order of $80 million to $85 million (1985 dollars). In our proposal to DOE, we have requested a commitment of $20 million (spread over three years) for completion of the $40 million first phase of PVUSA.

Given the current level of technical maturity of some photovoltaic systems, the value of the energy produced by this project can be expected to offset a portion of the project's cost. PGandE will supplement this value-based contribution with substantial R&D funding. Others whose program objectives the project supports, also are being requested to share funding responsibility. It is PGandE's intent to maximize the use of private sector resources while seeking government support only to the extent necessary to complement that of the private sector.

The results of the PVUSA project will benefit a broad spectrum of utilities and industry. Accordingly, PGandE is seeking federal assistance in establishing PVUSA as a logical and timely transition from federal to private leadership in solar photovoltaics.

PGandE's decision to launch PVUSA reflects serious interest in solar as a utility bulk energy supply option.

PGandE forecasts the need for 3,000 MV of new electric generation from renewable sources in the next two decades. Our service territory covers a wide spectrum of potential solar sites suitable for the application of various PV and other solar-electric technologies. PV power involves use of one of California's most abundant natural resources.

Project PVUSA is proposed as an expansion of PGandE's current photovoltaic R&D program. This project will build upon, complement, and interact strongly with national efforts, resulting in the development and transfer to industry of the technology necessary to commercialize utility-scale PV power systems.

PGandE has already worked closely with the Department of Energy on specific projects, sharing the costs of developing new energy technologies. In photovoltaics research, our goals are similar to those of the federal program to develop cost-effective technologies that can be used by the utility industry.

PGandE sees the need for a project like PVUSA and will take the private sector leadership role in the project on behalf of and as coordinator for other utilities. We are encouraged to do so by previous favorable consideration of the DOE/SMUD project.

We have offered a proposal to DOE for 1987 initiation. PGandE funded project concept defintion and evaluation of sites during 1985. PGandE is conducting 1986 preliminary engineering and related efforts at its own expense, and has requested cost sharing support for continuation of these activities during the second half of 1986 from the California Energy Commission. Note that expenditures of this magnitude for an R&D project are subject to approval by the California Public Utilities Commission.

As a systems research experiment, PVUSA is a necessary and natural complement to on-going commercial activity and cell research.

Through the perseverance and cooperation of the U.S. Congress, DOE, and industry, the cost of photovoltaic energy has dropped, the reliability of photovoltaic components and systems has increased, and conversion efficiencies have risen. However, additional improvements and experience are required before photovoltaic systems will be acceptable for central station generation and can be commercially applied by electric utilities.

During the course of its own extensive research in photovoltaic power technology, PGandE has perceived the need for an additional effort to bridge the gap from current R&D activities and systems

tests to readiness for broad utility commercialization. Discussions with other organizations in the PV industry have confirmed this special need in PV development.

We view the PVUSA project as a key step toward stabilizing and focusing future PV research. The project will fully use information already developed by DOE and the national laboratories, and capitalize on the knowledge and experience gained from PGandE's PV module and array test facility in San Ramon, California, and from recent operating photovoltaic installations.

PVUSA is needed by the U.S. utility industry.

The utility industry of this nation plays a vital role in its economy. In grappling with matters of energy supply, PGandE, like other utilities, faces a future of uncertainty and challenge. We are seeking to encourage and accelerate the development of new energy supply options which will add to our flexibility and capability to provide least cost service to our customers.

Project PVUSA provides an appropriate focus for utility industry efforts in developing the knowledge base and test data necessary for the acceptance of photovoltaic generation by U.S. utilities. PGandE and other utility companies must complete a well-founded development program before constructing demonstration plants and beginning the significant introduction of any new technology into their generation systems. A primary purpose of PVUSA is to ensure that the application of photovoltaic technologies is both economically sound and technically reliable. Economy and reliability of power supply are of paramount importance to all utilities and their customers.

The Electric Power Research Institute (EPRI) has reviewed the concept of Project PVUSA, provided input for the proposal, testified on its behalf, and indicated a desire for continuing interaction. Significant technology transfer from the project via EPRI is anticipated. Active participation in PVUSA by a number of other utilities throughout the country is actively being sought by PGandE. The initial response has been favorable.

PVUSA will improve the competitive posture of the U.S. PV industry.

The PVUSA project concept was developed in close cooperation with the PV industry. This cooperative project definition effort was initiated nearly a year ago. Two well attended industry coordination meetings were held at key stages in the process. Emphasis was placed on incorporating lessons from the DOE/SMUD project and assuring the appropriateness and fairness of the project procurement concept. We are confident that industry concerns have been identified and resolved. Our discussions with PV industry representatives reflect strong support for PVUSA.

This Committee is well aware of the investment this country has made in establishing U.S. industry in a preeminent position in the expanding world-wide photovoltaics market. Aggressive support of research and development has been the key. As you know, U.S. leadership is being challenged by other countries, notably Japan. PVUSA's value as an aid to U.S. industry in sharpening its competitive edge and as a showcase for U.S. technology should be given DOE consideration.

PVUSA is the next logical step in the on-going federal/private cooperation in PV systems research.

PGandE recognizes that the federal government perceives a need to shift a substantial share of the burden for research funding to the private sector; the PVUSA project provides an excellent model of how realistically that shift can successfully take place. It is proposed that the utility industry, which stands to gain from the eventual commercialization of PV technology, cost-share this research effort to the extend that the federal government pays only half the cost.

PGandE has taken the initiative in proposing PVUSA because it sees the need for a technology transfer bridge between current R&D activities and realization of a viable utility PV power generation option. This bridging action by a joint public-private sector effort may also point the way for other emerging power technologies.

PGandE requests Congressional support of the PVUSA initiative.

Over the past five years, we have witnessed a dramatic reduction in the federal research budget for the development of alternative energy technologies. Although the present price of oil is dropping and natural gas has become plentiful, we believe a stable Federal research program for the development of renewable energy resources is necessary for our future security. The effect of recent world oil market fluctuations only underscores the continuing volatility of energy price and supply, and the leverage energy exerts on the U.S. economy.

Much has already been done to enhance understanding of photovoltaics technology. It is not our intent to duplicate this work, but rather build upon it and provide a cost-efficient vehicle for future U.S. PV system test and evaluation efforts.

Accordingly, we would like to see funds for Phase 1 of PVUSA included in DOE's FY 1987-89 budgets and request your serious consideration of this important initiative. PVUSA will energize and focus the on-going development of a technology that will make an important contribution to our Nation's energy security.

Mr. Chairman, thank you for this opportunity to appear before the Subcommittee.

Mr. OSTROM. Mr. Chairman, members of the committee, in testifying before you today, Bechtel adds its voice to the U.S. utilities industry's request for Congressional support of this key project. Bechtel is pleased to have worked closely with the PG&E in developing the PVUSA concept. We have been involved for several years in PV systems design, and our company also is committed to support this new development technology.

A combination of government and industry has succeeded in dropping photovoltaic costs by an order of magnitude over 10 years. The performance and reliability of components and systems have been markedly increased. Yet, in order for the technology to achieve its potential as an important contributor to our nation's energy security, a three to four fold further cost reduction is necessary in utility-size installations. PVUSA, as the logical next step in a long-term program, is structured to complement ongoing Federal and privately-funded cell and component research in accomplishing this goal by the early to mid-1990s.

Furthermore, project PVUSA will be instrumental in maintaining the nation's supremacy in photovoltaics. The Japanese, especially, pose a serious threat to our current leadership in this technology.

With the discontinuation of the Sacramento Municipal Utility District PV program, an earlier program, PG&E has undertaken to define and propose this new and more powerful R&D approach, in which PG&E will design, deploy, test, and evaluate many promising photovoltaic technologies and systems now emerging from laboratory and small-scale test programs. During its lifetime, the PVUSA project will compare a variety of current and emerging PV technologies in a two-phase program, employment side-by-side, utility-scalable test beds at two sites. One of these will be at Davis, California, which is characterized by diffuse insulation, and the other at Carrisa Plains, which is in a region of direct sunlight.

PVUSA is an industry initiated long-range development venture. PG&E began a cooperative project definition with industry nearly a year ago. Emphasis has been placed on incorporating the knowledge gained from the DOE submitted project and insuring in an approach the incentives for innovative concepts would be included.

As a utility sponsored project, PVUSA will insure unbiased or mutual identification and selection of the most viable technologies for future bulk power supply. As a leading engineer constructor to the electric utilities, we at Bechtel recognize the need for comprehensive utility scalable field testing before significant interconnection of any new technology with a power grid.

Both PG&E and the industry see project PVUSA has a necessary and highly credible bridge for transferring current research and development technology and operating experience to the utilities for commercial electricity generation in the 1990s. We view the project as a key step toward stabilizing and focusing future photovoltaic research. PVUSA will encourage innovative system optimization and refinement. The project will fully use information already developed by the Department of Energy and the National Laboratories, and it will capitalize on the knowledge and experience gained from PG&E's PV module and array test facility in San

Ramon, California, and from a number of other recently operating photovoltaic installations.

It is not our intent to duplicate this work, but rather build upon it and provide a cost efficient vehicle for future U.S. photovoltaic test and evaluation efforts. In this way the project will leverage Federal monies which are available for utility scalable system applications, and it will complement the ongoing Federal and privately funded research activities.

Thank you for the opportunity to appear before you today.

[The statement of John A. Ostrom follows:]

TESTIMONY OF

JOHN A. OSTROM

PROJECT MANAGER BECHTEL POWER CORPORATION

SAN FRANCISCO, CALIFORNIA

BEFORE THE SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

OF THE HOUSE APPROPRIATIONS COMMITTEE

U. S. HOUSE OF REPRESENTATIVES, WASHINGTON, D. C.

April 10, 1986

SOLAR AND RENEWABLE R&D
DEPARTMENT OF ENERGY
FY87 BUDGET

PHOTOVOLTAICS FOR UTILITY SCALE APPLICATIONS (PVUSA)

SUMMARY

Bechtel Power Corporation joins the Pacific Gas and Electric Company and the PV industry in requesting that the FY 1987-89 DOE Budgets for solar energy include a line item for cooperative funding of the proposed PGandE R&D project, "Photovoltaics for Utility Scale Applications" (PVUSA).

PVUSA is an industry-initiated R&D venture for long range development of central power station photovoltaic technology and systems. It meets the Administration's guidelines for joint government and industry partnerships in support of long term high-risk applied technology development.

The project will provide a test bed in a utility environment for the side-by-side deployment, comparative evaluation and further development of a variety of promising, emerging photovoltaic technologies in utility-scalable segments. It will contribute to continuing improvements in the performance, reliability and cost of PV components and systems and provide the comprehensive field testing and operating experience which must precede utility scale applications.

PVUSA will be instrumental in maintaining the nation's supremacy in photovoltaics. It will contribute to our energy security and help position the U.S. in growing world markets.

The project will provide a highly credible bridge for focusing the transfer of R&D technology to utilities for commercial installations in the 1990's. Furthermore, it will leverage Federal monies available for utility-scalable system applications and will complement both federally and privately-funded cell research activities.

Mr. Chairman,

Bechtel Power Corporation respectfully asks the Subcommittee for its positive consideration of FY 1987-89 budget line item matching funds for the Pacific Gas and Electric Company's proposed solar power research and development project, "Photovoltaics for Utility Scale Applications" (PVUSA). Bechtel is pleased to have worked closely with PGandE in developing the PVUSA concept. We have been involved for several years in PV systems design and our company is committed to support the technology.

This project continues more than a decade's successful building of photovoltaics technology, through industrial research and by university and national laboratory teams, to a critical point where progress is ahead of schedule, and viable large scale commercial power application is on the horizon. A combination of government and industry has succeeded in dropping photovoltaic costs by an order of magnitude over 10 years. The performance and reliability of components and systems have been markedly increased. Yet, in order for the technology to achieve its potential as an important contributor to our nation's energy security, a three to four fold further cost reduction is necessary in utility-size installations. PVUSA, as the logical next step in a long term program, is structured to complement ongoing Federal and privately-funded cell and component research in accomplishing this goal by the early to mid-1990's.

Furthermore, project PVUSA will be instrumental in maintaining the nation's supremacy in photovoltaics. The Japanese, especially, pose a serious threat to our current leadership in this technology. Last year, for the first time, they out-produced us in total solar cell capacity and there is every indication that Japan is stepping up its research and development efforts, particularly in the promising area of thin-films. Letting the U.S. fall into second place not only would make domestic application of photovoltaics more costly but it would jeopardize our ability to compete effectively in world markets, where many developing countries are short of indigenous fuels but long on sunshine.

In testifying before you, Bechtel adds its voice to the U.S. utilities' and industry's request for Congressional support of this key project. PVUSA is an industry-initiated, cooperatively-funded R&D venture for long range development of central power station photovoltaic technology and systems. It meets the Administration's guidelines for cooperative partnerships between industry and government in support of long term, high-risk applied technology development.

As a leading Engineer/Constructor to the electric utilites, we recognize the need for comprehensive utility-scalable field testing of all new generating technologies before proceeding with the construction of demonstration plants and the significant inter-connection of any new technology with the power grid. A primary purpose of PVUSA is to ensure that the application of photovoltaic technologies is both economically sound and technically reliable. Thus, the project will provide utilities the specific technical base needed to proceed with confidence toward future commercial installations.
It will help to regain the technological momentum lost due to cancellation of the Sacramento Municipal Utility District's 5 MW peak PV unit, which would have supplemented the U.S. utilities' operating experience with photovoltaics and provided an increased degree of confidence in this renewable resource. The SMUD Project also was to have been cooperatively funded by DOE.

With the discontinuation of the SMUD program, PGandE has undertaken to define and propose this new and more powerful R&D approach, in which PGandE will design, deploy, test, and evaluate many promising photovoltaic technologies and systems now emerging from laboratory and small scale test programs. During its lifetime, the PVUSA project will compare a variety of current and emerging PV technologies in a two-phase program, employing side-by-side, utility-scalable test beds at two sites, one characterized by diffuse and the other by direct solar insolation.

In Phase 1, the project will have deployed by 1989 3.5MWp of power generating segments at the two selected sites, one adjacent to the City of Davis and the other at Carrisa Plains (eastern San Luis Obispo County). Contingent upon the test results of Phase 1, the levels of PV cost and performance achieved, and the general economics of electricity generation in 1990, capacity at the two sites may be expanded to a total of 5 MWp each, in a second phase to be completed in 1995.

Fifty percent Federal cost sharing is requested at this time for Phase 1, which is estimated to total approximately $39.5 million. The $20 million of DOE matching funds will be expended in fiscal years 1987-89, inclusive. The California Energy Commission has been asked to share funding responsibility. The remainder of the project's costs will be borne by PGandE, other utilities and industry. The value of energy to be produced can be expected to offset a portion of the project's cost.

PGandE and Bechtel have been partners with the Department of Energy in other specific projects, sharing the costs of developing promising new energy technologies. In photovoltaics, our research goals are similar to those of the Federal program, i.e., to develop cost-effective technologies that can be used by the utility industry. Project PVUSA will build upon, complement and interact strongly with, national efforts. A special need exists in photovoltaics for this degree of cooperative effort, due to the wide variety of PV cell and balance of system technologies, their differing levels of maturity, divergent industrial applications and the fundamental influence on system design of different site insolation characteristics. As a utility-sponsored project, PVUSA will assure an unbiased or neutral identification and selection of the most viable technologies.

Both PGandE and the industry see Project PVUSA as a necessary and highly credible bridge for transferring current R&D technology and operating experience to the utilities for commercial electricity generation in the 1990's. This bridging action by a joint public/private sector effort will become a major driving force for U.S. PV power development and may point the way for other emerging energy technologies as well.

We view the PVUSA project as a key step toward stabilizing and focusing future PV research. PVUSA will encourage innovative system optimization and refinement. The project will fully use information already developed by DOE and the national laboratories, and capitalize on the knowledge and experience gained from PGandE's PV module and array test facility in San Ramon, California, and from recent operating photovoltaic installations. It is not our intent to duplicate this work, but rather build upon it and provide a cost-efficient vehicle for future U.S. PV system test and evaluation efforts. In this way, the project will leverage Federal monies available for utility-scalable system applications and will complement ongoing Federal and privately-funded cell research activities.

I thank you for this opportunity to appear before the Subcommittee.

THURSDAY, APRIL 10, 1986.

PHOTOVOLTAICS FOR UTILITY SCALE APPLICATIONS

WITNESS

ROBERT A. TRAVERSO, ASSISTANT CITY MANAGER, CITY OF DAVIS, CALIFORNIA

Mr. BEVILL. Thank you.

Mr. TRAVERSO. Mr. Chair, members of the subcommittee, the City of Davis, as Mr. Vance has indicated, is one of the partners in the proposed project.

The energy crises that this country recently experienced seem, deceptively, to be past history. The price of crude oil is the lowest that it has been in years. However, imported oil still constitutes a significant and growing percentage of the oil consumed in this country. Moreover, the current oil buyers market is not likely to remain the pattern of the future. However, if we use our time and resources wisely, we can plan and better prepare ourselves for the next oil based energy crisis.

One of the lessons of the recent energy crises was that this country needed to, and could, more efficiently utilize the energy that it consumed, and that this country could implement various energy conservation measures relatively easily and economically. Some energy conservation measures have been implemented. However, more could and should be done to encourage and expand energy conservation activities on a change of life style approach rather than on a crash diet approach.

One of the other lessons of the recent energy crises is the importance of developing economically sensible and environmentally sensitive alternative energy sources, and that to do so, takes time, money and a sustained and cooperative commitment by government and the private sector. Photovoltaic power generation could be one of these alternatives.

Pacific Gas and Electric Company, the utility company that services the City of Davis and most of northern California, has taken a proactive, creative and cooperative approach with the City of Davis in the development and implementation of various energy conservation measures in our community. In addition, we have cooperated closely with PG&E on the successful installation in 1982 of a small scale pilot photovoltaic facility on a city owned building. This installation is still operational and is still providing PG&E with valuable information about the performance of photovoltaic panels under various weather conditions.

The City of Davis has been, and is supportive of PG&E's proposed photovoltaic project, and has proposed to make available to PG&E a city owned site for this project. This city owned site is an abandoned wastewater treatment facility/landfill site. PG&E's proposed photovoltaic project would be an excellent recycling of this site.

The City of Davis and PG&E have a demonstrated track record of successfully developing and implementing energy conservation projects. The City of Davis would welcome and appreciate the opportunity to work with PG&E and the Federal Government to suc-

cessfully implement the proposed photovoltaic project, and in turn, to assist with our national effort to develop economically sensible and environmentally sensitive alternative energy sources.

The City of Davis respectfully recommends that this committee support the appropriations of the previously appropriated but unused federal funds from the Sacramento Municipal Utility District's photovoltaic project for PG&E's proposed photovoltaic project.

On behalf of the City of Davis, I thank you for the opportunity to address this committee.

Mr. FAZIO. Thank you, Mr. Chairman.

As most members of the committee I am sure are well aware, I have a long and ongoing interest in photovoltaics. I am particularly pleased to see this presentation and the proposal that the committee has and the opportunities to act on this year.

These three gentlemen are all friends of mine. I think they have given us an opportunity to move on from the hiatus we have been at on photovoltaics and particularly I want to highlight the fact that the City of Davis is participating in and distributing some of its assets to the project. The city has a long history of innovative energy strategy that has been on the forefront of the effort to conserve, use renewable energy sources, and so are here today representing that tradition. And of course, Jack Vance and PG&E deserve recognition for their innovative approach to a whole wide range of energy sources, and Bechtel, I am sure you know, provides us with a tremendous amount of background.

This committee has dealt with them with every range of energy development. So I think that we have great opportunities and I certainly am hopeful the committee will pick up this challenge. The 50-50 cost share is right down our alley and is what we want to see in terms of private sector involvement, and certainly I think this is a step in the direction of the Administration's priorities, too, to move in the direction of commercialization with a real world focus and not some theoretical commitment to energy resources, but one that will be in the marketplace.

So I thank you, Mr. Chairman, for letting them have so much time and I certainly hope we can be of assistance.

Mr. BEVILL. Thank you very much.

CITY COUNCIL (916) 756-3745

Ann M. Evans, Mayor
Deborah N. Poulos, Mayor pro tempore
Gerald J. Adler, Councilman
Dave Rosenberg, Councilman
Thomas J. Tomasi, Councilman

CITY OF DAVIS 23 Russell Blvd. Davis, CA 95616

April 4, 1986

Honorable Tom Bevill, Chairperson
House Appropriations Subcommittee on
Energy and Water Development
Room 2362
Rayburn Office Building
Washington, D.C. 20515

and

Senator Mark O. Hatfield, Chairperson
Senate Appropriations Subcommittee on
Energy and Water Development
Room 142
Dirksen Senate Office Building
Washington, D.C. 20510

Dear Honorable Bevill and Senator Hatfield:

The recent energy crises that this country experienced seem deceptively less real and urgent today. The price of crude oil and gasoline are the lowest that they have been in years. Some energy conservation measures have been implemented by government, business, and private citizens. However, imported oil still constitutes a significant and growing percentage of the oil consumed by this country.

One of the lessons of these energy crises was that this country needed to, and could, utilize the energy that it consumed in a more efficient manner, and that it could implement various energy conservation measures relatively easily and economically. One of the other lessons of these energy crises is the importance of developing economically sensible and environmentally sensitive alternative sources of energy, and that, to do so, takes time, money, and sustained commitment by government and the private sector.

Pacific Gas & Electric Company, the utility company that services the City of Davis and most of northern California, has taken a very proactive, creative, and responsive approach in cooperating with the City of Davis in the development and implementation of various energy conservation measures in our community. In addition, we have cooperated closely on the successful installation in 1982 of a small-scale, pilot, photovoltaic facility on a city-owned building; this installation is still operational and providing P.G.& E. with valuable information about the performance of photovoltaic panels under various weather conditions.

The City of Davis has been, and is, supportive of P.G.& E.'s proposed photovoltaic project, and is prepared to make available to P.G.& E. a city-owned site for this project. (This city-owned site is an "abandoned" wastewater treatment facility/landfill site; P.G.& E.'s proposed photovoltaic project would be an excellent "recycling" of this site.)

The City of Davis and P.G.& E. have a demonstrated track-record of successfully developing and implementing energy conservation projects. The City of Davis would welcome and appreciate the opportunity to work together with P.G.& E. and the Federal government to successfully implement the proposed photovoltaic project, and to assist with our national effort to develop economically sensible and environmentally sensitive alternative energy sources.

As part of our nation's continuing long-term need to develop economically sensible and environmentally sensitive alternative energy sources, the City of Davis supports P.G.& E.'s proposed phtovoltaic project, and respectfully recommends and encourages this Committee and the federal government to appropriate the previously unused Federal funds from the Sacramento Municipal Utility District photovoltaic project for P.G.& E.'s proposed photovoltaic project.

Sincerely,

Ann M. Evans

ANN M. EVANS
Mayor

AME:br
cc: Senator Alan Cranston
Senator Pete Wilson
Congressman Vic Fazio
Jerry Braun, P.G.& E., San Ramon
Don Greenbaum, P.G.& E., Davis
Davis City Council

THURSDAY, APRIL 10, 1986.

MINORITY EDUCATIONAL INSTITUTION ASSISTANCE PROGRAM

WITNESSES

JAMES HEFNER, PRESIDENT, JACKSON, STATE UNIVERSITY

ROBERT E. BATES, MANAGER, CHEMICAL AND ENVIRONMENTAL AFFAIRS AND TECHNOLOGY, MOBIL OIL AND MEMBER, EXECUTIVE BOARD, AMERICAN ASSOCIATION OF BLACKS IN ENERGY

Mr. BEVILL. Next we have Dr. James Hefner and his group. If all of you would come forward we will be glad to hear from you. We are glad to have you. The committee has set aside 15 minutes for you. Of course, if you can summarize in a little shorter time, that will impress us at this time of the day.

Mr. HEFNER. Thank you very much, Mr. Chairman.

Mr. Chairman, members of the subcommittee, my name is James Hefner, President of Jackson State University, which is the designated urban university of the State of Mississippi, and the 6th largest historically black institution in the United States. I am here as a proxy for Dr. Frederick Humphries, President of Florida A&M and also Chairman of the National Association for Equal Opportunity—NAFEO. Dr. Humphries prepared testimony for this occasion, but because of unforeseen circumstances had to cancel his flight for this hearing.

Mr. Chairman, if permission is granted, I wish to read Dr. Humphries' testimony as I fully endorse it.

Mr. BEVILL. Certainly. Without objection that will be all right and his statement will be made part of the record.

Mr. HEFNER. Mr. Chairman, and members of the subcommittee, it is a pleasure to appear before you today to present the interests of the scientific community of the historically black colleges and universities. In addition to serving as President of Florida State A&M University, I am also Chairman of the Science and Technology Advisory Committee of the National Association of Equal Opportunity. Since its inception, this committee has provided the leadership in articulating the views of the minority community in regard to the formulation of national policy on research, development and manpower training in the sciences and technology. It is in the capacity of chairman of this committee that I speak to you today.

The underrepresentation of blacks in the sciences and technology is well known. With your permission and for the record, I would like to submit a copy of the testimony presented by me on behalf of the committee to the National Science Foundation in December of last year. This testimony extensively discussed the long range impact on the nation of this underrepresentation if effective solutions are not found in the immediate future.

The Science and Technology Advisory Committee of NAFEO understands fully that an effective system of science and engineering education is vital to the long term interest of the United States as this country strives to strengthen its economy, its national defense, and the quality of life and well being of its citizens. The centrality of science and technology to American life is a recognized fact. It is

evident that this nation's future prosperity and security is dependent upon the maintenance of a sufficient number of adequately trained scientists and engineers to respond to national needs and priorities.

Since 1983, and even earlier, the Office of Minority Economic Impact of the Department of Energy, has worked hard to provide minority institutions with the opportunities to participate in Department of Energy's basic research and development programs. We know that the Office of Minority Economic Impact shares our concerns about the grave underrepresentation of minorities, not only in the energy industry, but in the many fields of high technology.

I would like to note that the working relationship established with OMEI was consistently improved as program related communication and interactions with Department of Energy have increased. The Science and Technology Advisory Committee is very proud to acknowledge that, through our campus based network of encouragement and information dissemination, the department's implementation of executive order 12320 has seen Department of Energy program awards increase from $1.9 million in FY 82 to $8.1 million in FY 85. This, however, brings me to the matter of the most recent federal budget request for the department.

Careful review of the fiscal year 1987 budget request for the Office of Minority Economic Impact, which coordinates the department's implementation of the HBCU initiative, indicates that the adjusted appropriated FY 86 figure of $2.596 million is an eight percent increase over the FY 85 appropriation level of $1.408 million. I would like to point out that the original benchmark figure for FY 86 was $2.827, as approved by the congressional conference process. Thus, what on the surface appears for FY 86, to be an eight percent increase over the FY 85 appropriations level, is in reality a nine percent decrease over the originally appropriated amount for FY 86.

Minorities are just as concerned as the next American about balancing the budget whether through general reductions or Gramm-Rudman-Hollings reductions. What we are most upset about is that it appears that the Department of Energy is trading proportionately deeper cuts in areas that affect us in particular. A quick review of the proposed departmental administration reductions indicates that with the exception of management and administration—which has the largest total budget amount—MI is the only other office for which such sizable reductions are slated.

As the MI budget is more closely scrutinized, you will observe that the total budget plans for FY 86 and FY 87 are not at all consistent with the program planning activities taking place throughout the department. Over the last year the HBCUs have received in depth orientations to research needs and priorities of the various program offices of the department. These self-development activities and hands-on interactions with research experts have resulted in a new awareness, capability and interest in (1) energy conservation and utilization technology; (2) radioactive waste management; (3) health and environmental research; and (4), the basic energy sciences, all areas of medium and long term significant in the nation's energy technologies.

In recognition of present and future federal budgetary constraints, the HBCUs formulated and are in the process of implementing a series of collaborative research clusters in the aforementioned areas. Decidedly those activities will receive their greatest fiscal support from the program operations offices. However, for such research efforts to be successful, the Office of Minority Economic Impact has acknowledged the need for the development of an increased research infrastructure at the participating institutions.

Mr. Chairman, I would like to point out that this kind of infrastructural support is being provided at majority institutions by new initiatives such as the Department of Defense University Research Initiatives Program and the National Science Foundation Engineering, Materials and Supercomputer centers.

Much planning has gone into identifying the elements that are essential for adequate infrastructure in the sciences at HBUCs:

Support of sophisticated equipment, the use of which is not attached to any particular project or principal investigator.

Funds to strengthen physical resources.

Alterations to and renovation of laboratories.

Provision of support services, including electronics and computer technicians, machinists, and other centralized resources.

Computer conference capability to increase the frequency and quality of information flowing from public and private research sources.

Provision of released time for faculty.

Resources for visiting scholars, lecturers, researchers.

Opportunity for joint research and peer review.

Research assistantships.

Student and faculty travel to scientific meetings.

Laboratory visits.

It has always been the position of the MI office that the minority educational institutional assistance programs would be where such support would be forthcoming. Under this program, direct support would be provided to those institutions that are committed to establishing and maintaining science and technology research and development centers. The aim of this overall effort is to move minority institutions into a fully competitive posture.

If, however, we were to follow the logic prescribed by the fiscal year 1987 budget request document, then as many as 150 minority institutions would compete for a total of $393,000 in FY 86 and $393,000 in fiscal year 1987 when one considers the proposed deferral request. In my view, that level of support will not be enough for even two centers.

Just as the Department of Energy and the HBCUs are for the first time poised to implement a well conceived, aggressive and systematized approach to improve the capability of HBCUs to compete for Department of Energy research and development grants and contracts, the necessary funding to make that a reality appears not to be forthcoming. It is for these reasons, therefore, that providing only $121,000 for the honors program in fiscal year 1987 and no funds for the minority institution assistance program will be a tragic mistake. Consequently, I respectfully request that the fiscal year 1987 request for the minority honors training program be in-

creased by $200,000 and the minority educational assistance program be provided an additional $1.3 million to establish at least four or five Department of Energy research and development centers.

Let me briefly speak to the significant ongoing initiatives in black colleges and universities. At my university, for example—Jackson State University—there is the LBL/Jackson State University Research Collaboration, which is the model for this nation.

At Mahari Medical College, and Tennessee State University, there is a lot of work on health effects of energy use.

At Alabama A&M University, much work has been done on biomass and materials and defense.

At Atlanta University and Xavier University, there is a collaborative relationship regarding math and computational sciences.

Mr. Chairman, that concludes my remarks. My colleagues and I are prepared to answer any questions you or the members of your subcommittee may have regarding these concerns.

[The statement of Mr. Humphries follows:]

Florida Agricultural and Mechanical University
Tallahassee, Florida
904/599-3000
ZIP CODE: 32307
FREDERICK S. HUMPHRIES, PRESIDENT
OFFICE OF THE PRESIDENT

TESTIMONY PRESENTED ON BEHALF OF THE

SCIENCE AND TECHNOLOGY ADVISORY COMMITTEE OF THE
NATIONAL ASSOCIATION FOR EQUAL OPPORTUNITY
IN HIGHER EDUCATION
(NAFEO)

HOUSE ENERGY AND WATER DEVELOPMENT SUBCOMMITTEE
ON APPROPRIATIONS

BY
DR. FREDERICK S. HUMPHRIES
PRESIDENT
FLORIDA A&M UNIVERSITY

APRIL 10, 1986

FAMU IS AN EQUAL OPPORTUNITY/ EQUAL ACCESS UNIVERSITY

MR. CHAIRMAN AND MEMBERS OF THE SUBCOMMITTEE:

IT IS A PLEASURE TO APPREAR BEFORE YOU TODAY TO PRESENT THE INTERESTS OF THE SCIENTIFIC COMMUNITY OF THE HISTORICALLY BLACK COLLEGES AND UNIVERSITIES (HBCUs). IN ADDITION TO SERVING AS PRESIDENT OF FLORIDA A&M UNIVERSITY, I AM ALSO CHAIRMAN OF THE SCIENCE AND TECHNOLOGY ADVISORY COMMITTEE OF THE NATIONAL ASSOCIATION FOR EQUAL OPPORTUNITY (NAFEO). SINCE ITS INCEPTION, THIS COMMITTEE HAS PROVIDED THE LEADERSHIP IN ARTICULATING THE VIEWS OF THE MINORITY COMMUNITY IN REGARD TO THE FORMULATION OF NATIONAL POLICY ON RESEARCH, DEVELOPMENT, AND MANPOWER TRAINING IN THE SCIENCES AND TECHNOLOGY. IT IS IN THE CAPACITY OF CHAIRMAN OF THIS COMMITTEE THAT I SPEAK TO YOU TODAY.

LET ME INTRODUCE MY COLLEAGUES.

THE UNDERREPRESENTATION OF BLACKS IN THE SCIENCES AND TECHNOLOGY IS WELL KNOWN. WITH YOUR PERMISSION AND FOR THE RECORD, I WOULD LIKE TO SUBMIT A COPY OF THE TESTIMONY PRESENTED BY ME ON BEHALF OF THE COMMITTEE TO THE NATIONAL SCIENCE FOUNDATION IN DECEMBER LAST YEAR. THIS TESTIMONY EXTENSIVELY DISCUSSED THE LONG-RANGE IMPACT ON THE NATION OF THIS UNDERREPRESENTATION IF EFFECTIVE SOLUTIONS ARE NOT FOUND IN THE IMMEDIATE FUTURE.

THE SCIENCE AND TECHNOLOGY ADVISORY COMMITTEE OF NAFEO UNDERSTANDS FULLY THAT AN EFFECTIVE SYSTEM OF SCIENCE AND ENGINEERING EDUCATION IS VITAL TO THE LONG-TERM INTEREST OF THE UNITED STATES AS THIS COUNTRY STRIVES TO STRENGTHEN ITS ECONOMY, ITS NATIONAL DEFENSE, AND THE QUALITY OF LIFE AND WELL-BEING OF ITS CITIZENS. THE CENTRALITY OF SCIENCE AND TECHNOLOGY TO AMERICAN LIFE IS A RECOGNIZED FACT. IT IS EVIDENT THAT THIS NATION'S FUTURE PROSPERITY AND SECURITY IS DEPENDENT UPON THE MAINTENANCE OF A SUFFICIENT NUMBER OF ADQUATELY TRAINED SCIENTISTS AND ENGINEERS TO RESPOND TO NATIONAL NEEDS AND PRIORITIES.

SINCE 1983, AND EVEN EARLIER, THE OFFICE OF MINORITY ECONOMIC IMPACT (OMEI) OF THE DEPARTMENT OF ENERGY, HAS WORKED HARD TO PROVIDE MINORITY INSTITUTIONS WITH THE OPPORTUNITIES TO PARTICIPATE IN DOE'S BASIC RESEARCH AND DEVELOPMENT PROGRAMS. WE KNOW THAT THE OFFICE OF MINORITY ECONOMIC IMPACT SHARES OUR CONCERNS ABOUT THE GRAVE UNDERREPRESENTATION OF MINORITIES, NOT ONLY IN THE ENERGY INDUSTRY, BUT IN THE MANY FIELDS OF HIGH TECHNOLOGY. I WOULD LIKE TO NOTE THAT THE WORKING RELATIONSHIP ESTABLISHED WITH OMEI HAS CONSISTENTLY IMPROVED AS PROGRAM-RELATED COMMUNICATION AND INTERACTIONS WITH DOE HAVE INCREASED. THE SCIENCE AND TECHNOLOGY ADVISORY COMMITTEE IS VERY PROUD TO ACKNOWLEDGE THAT--THROUGH OUR CAMPUS-BASED NETWORK OF ENCOURAGEMENT AND INFORMATION DISSEMINATION--THE DEPARTMENT'S IMPLEMENTATION OF EXECUTIVE ORDER 12320 HAS SEEN DOE PROGRAM AWARDS INCREASE FROM $1.9 MILLION IN FY 1982 TO $8.1 MILLION IN FY 1985. THIS, HOWEVER, BRINGS ME TO THE MATTER OF THE MOST RECENT FEDERAL BUDGET REQUEST FOR THE DEPARTMENT.

CAREFUL REVIEW OF THE FY 1987 BUDGET REQUEST FOR THE OFFICE OF MINORITY ECONOMIC IMPACT, WHICH COORDINATES THE DEPARTMENT'S IMPLEMENTATION OF THE HBCU INITIATIVE, INDICATES THAT THE ADJUSTED APPROPRIATED FY 1986 FIGURE OF $2.596 MILLION IS AN 8% INCREASE OVER THE FY 1985 APPROPRIATION LEVEL OF $2.408 MILLION. I WOULD LIKE TO POINT OUT THAT THE ORIGINAL BENCHMARK FIGURE FOR FY 1986 WAS $2.827, AS APPROVED BY THE CONGRESSIONAL CONFERENCE PROCESS. THUS, WHAT ON THE SURFACE APPEARS, FOR FY 1986, TO BE AN 8% INCREASE OVER THE FY 1985 APPROPRIATIONS LEVEL, IS IN REALITY A 9% DECREASE OVER THE ORIGINALLY APPROPRIATED AMOUNT FOR FY 1986.

MINORITIES ARE JUST AS CONCERNED AS THE NEXT AMERICAN ABOUT BALANCING THE BUDGET WHETHER THROUGH GENERAL REDUCTIONS OR GRAMM-RUDMAN-HOLLINGS REDUCTIONS. WHAT WE ARE MOST UPSET ABOUT IS THAT IT APPEARS THAT THE DEPARTMENT

OF ENERGY IS TAKING PROPORTIONATELY DEEPER CUTS IN AREAS THAT AFFECT US IN PARTICULAR. A QUICK REVIEW OF THE PROPOSED DEPARTMENTAL ADMINISTRATION REDUCTIONS INDICATES THAT WITH THE EXCEPTION OF MANAGEMENT AND ADMINISTRATION--WHICH HAS THE LARGEST TOTAL BUDGET AMOUNT--MI IS THE ONLY OTHER OFFICE FOR WHICH SUCH SIZEABLE REDUCTIONS ARE SLATED.

AS THE MI BUDGET IS MORE CLOSELY SCRUTINIZED, YOU WILL OBSERVE THAT THE TOTAL BUDGET PLANS FOR FY 1986 AND FY 1987 ARE NOT AT ALL CONSISTENT WITH THE PROGRAM PLANNING ACTIVITIES TAKING PLACE THROUGHOUT THE DEPARTMENT. OVER THE LAST YEAR THE HBCUs HAVE RECEIVED IN-DEPTH ORIENTATIONS TO RESEARCH NEEDS AND PRIORITIES OF THE VARIOUS PROGRAM OFFICES OF THE DEPARTMENT. THESE SELF-DEVELOPMENT ACTIVITIES AND HANDS-ON INTERACTIONS WITH RESEARCH EXPERTS HAVE RESULTED IN A NEW AWARENESS, CAPABILITY AND INTEREST IN (1) ENERGY CONSERVATION AND UTILIZATION TECHNOLOGY, (2) RADIOACTIVE WASTE MANAGEMENT, (3) HEALTH AND ENVIRONMENTAL RESEARCH, AND (4) THE BASIC ENERGY SCIENCES, ALL AREAS OF MEDIUM- AND LONG-TERM SIGNIFICANCE IN THE NATION'S ENERGY TECHNOLOGIES.

IN RECOGNITION [redacted] OF PRESENT AND FUTURE FEDERAL BUDGETARY CONSTRAINTS, THE HBCUs FORMULATED AND ARE IN THE PROCESS OF IMPLEMENTING A SERIES OF COLLABORATIVE RESEARCH CLUSTERS IN THE AFOREMENTIONED AREAS. DECIDELY, THOSE ACTIVITIES WILL RECEIVE THEIR GREATEST FISCAL SUPPORT FROM THE PROGRAM OPERATIONS OFFICES. HOWEVER, FOR SUCH RESEARCH EFFORTS TO BE SUCCESSFUL, THE OFFICE OF MINORITY ECONOMIC IMPACT HAS ACKNOWLEDGED THE NEED FOR THE DEVELOPMENT OF AN INCREASED RESEARCH INFRASTRUCTURE AT THE PARTICIPATING INSTITUTIONS. MR. CHAIRMAN, I WOULD LIKE TO POINT OUT THAT THIS KIND OF INFRASTRUCTURAL SUPPORT IS BEING PROVIDED TO MAJORITY INSTITUTIONS BY NEW INITIATVES SUCH AS THE DEPARTMENT OF DEFENSE UNIVERSITY RESEARCH INITIATIVES PROGRAM

AND THE NATIONAL SCIENCE FOUNDATION ENGINEERING, MATERIALS AND SUPERCOMPUTER CENTERS.

MUCH PLANNING HAS GONE INTO IDENTIFYING THE ELEMENTS THAT ARE ESSENTIAL FOR ADEQUATE INFRASTRUCTURE IN THE SCIENCES AT HBCUs:

-- SUPPORT OF SOPHISTICATED EQUIPMENT, THE USE OF WHICH IS NOT ATTACHED TO ANY PARTICULAR PROJECT OR PRINCIPAL INVESTIGATOR;
-- FUNDS TO STRENGTHEN PHYSICAL RESOURCES;
-- ALTERATIONS TO AND RENOVATION OF LABORATORIES;
-- PROVISION OF SUPPORT SERVICES, INCLUDING ELECTRONICS AND COMPUTER TECHNICIANS, MACHINISTS, AND OTHER CENTRALIZED RESOURCES;
-- COMPUTER CONFERENCE CAPABILITY TO INCREASE THE FREQUENCY AND QUALITY OF INFORMATION FLOWING FROM PUBLIC AND PRIVATE RESEARCH SOURCES;
-- PROVISION OF RELEASED TIME FOR FACULTY;
-- RESOURCES FOR VISITING SCHOLARS, LECTURERS, RESEARCHERS;
-- OPPORTUNITY FOR JOINT RESEARCH AND PEER REVIEW;
-- RESEARCH ASSISTANTSHIPS;
-- STUDENT AND FACULTY TRAVEL TO SCIENTIFIC MEETINGS;
-- LABORATORY VISITS;

IT HAS ALWAYS BEEN THE POSITION OF THE MI OFFICE THAT THE MINORITY EDUCATIONAL INSTITUTION ASSISTANCE PROGRAMS WOULD BE WHERE SUCH SUPPORT WOULD BE FORTHCOMING. UNDER THIS PROGRAM DIRECT SUPPORT WOULD BE PROVIDED TO THOSE INSTITUTIONS THAT ARE COMMITTED TO ESTABLISHING AND MAINTAINING "SCIENCE AND TECHNOLOGY RESEARCH AND DEVELOPMENT CENTERS." THE AIM OF THIS OVERALL EFFORT IS "TO MOVE MINORITY INSTITUTIONS INTO A FULLY COMPETITIVE POSTURE."

IF, HOWEVER, WE WERE TO FOLLOW THE LOGIC PRESCRIBED BY THE FY 1987 BUDGET REQUEST DOCUMENT, THEN AS MANY AS 150 MINORITY INSTITUTIONS WOULD COMPETE FOR A TOTAL OF $393,000 IN FY 1986 AND $393,000 IN FY 1987--WHEN ONE CONSIDERS THE PROPOSED DEFERRAL REQUEST. IN MY VIEW, THAT LEVEL OF SUPPORT WILL NOT BE ENOUGH FOR EVEN TWO CENTERS.

JUST AS THE DEPARTMENT OF ENERGY AND THE HBCUs ARE FOR THE FIRST TIME POISED TO IMPLEMENT A WELL-CONCEIVED, AGGRESSIVE AND SYSTEMATIZED APPROACH TO IMPROVE THE CAPABILITY OF HBCUs TO COMPETE FOR DOE RESEARCH AND DEVELOPMENT GRANTS AND CONTRACTS, THE NECESSARY FUNDING TO MAKE THAT A REALITY APPEARS NOT TO BE FORTHCOMING. IT IS FOR THESE REASONS, THEREFORE, THAT PROVIDING ONLY $121,000 FOR THE HONORS PROGRAM IN FY 1987 AND NO FUNDS FOR THE MINORITY INSTITUTION ASSISTANCE PROGRAM WILL BE A TRAGIC MISTAKE. CONSEQUENTLY, I RESPECTFULLY REQUEST THAT THE FY 1987 REQUEST FOR THE MINORITY HONORS TRAINING PROGRAM BE INCREASED BY $200,000 AND THE MINORITY EDUCATIONAL ASSISTANCE PROGRAM BE PROVIDED AN ADDITIONAL $1.3 MILLION TO ESTABLISH AT LEAST FOUR OR FIVE DOE RESEARCH AND DEVELOPMENT CENTERS.

MR. CHAIRMAN, THIS CONCLUDES MY REMARKS. MY COLLEAGUES AND I ARE PREPARED TO ANSWER ANY QUESTIONS YOU OR THE MEMBERS OF YOUR SUBCOMMITTEE MAY HAVE REGARDING THESE CONCERNS.

A PROGRAM TO ENHANCE THE INVOLVEMENT OF HISTORICALLY BLACK INSTITUTIONS IN SOLVING A NATIONAL PROBLEM: SCIENCE AND TECHNOLOGY RESEARCH AND TRAINING

Presented by:
Frederick Humphries, Ph.D.
President of Florida Agricultural and Mechanical University
Chairman, Science and Technology Advisory Committee
National Association for Equal Opportunity in Higher Education

December 20, 1985

Introduction

An effective system of science and engineering education is vital to the long-term interest of the United States as this country strives to strengthen its economy, its national defense, and the quality of life and well-being of its citizens. The centrality of science and technology to American life is a recognized fact, and it is evident that this Nation's future prosperity and security is dependent upon the maintenance of a sufficient number of adequately trained scientists and engineers to respond to national needs and priorities.

One key to ensure a supply of adequately trained scientists and engineers is through continued support of research and training at the Nation's colleges and universities to foster the generation of new knowledge related to national priorities and to produce a cohort of technically trained personnel. As was outlined in the article "Federal R&D and Industrial Policy," in a past issue of Science, American research universities, as a group, are the best in the world and have a central role in ensuring the nation's long-term economic health. One direct and effective way to meet future needs is to take advantage of the existing mechanisms at the Nation's colleges and universities that permit student participation in research as a part of their training. The article stated further, "...tomorrow's industrial growth will depend on the availability of skilled technical personnel." One way to ensure the availability of skilled technical personnel is to ensure that all of our citizens have equal access to scientific and technical training and careers. With respect to Black Americans, that logically means the Historically Black Institutions (HBI's). HBI's enrolled 27% of the Black college students in 1980 and accounted for 34% of all Black undergraduate degrees. They produced more than 40% of the degrees awarded to Black students in science & technology. Based on that data, it follows that programs designed to enhance the participation of Blacks in science and technology and national priorities related to the scientific and technological enterprise must involve HBI's. Because of the underrepresentation of Blacks in the sciences, it is critical that significant and bold initiatives be taken to develop this talent pool. Tables 1 and 2 point out the deplorably low level of participation by Blacks in training programs in science and technology at all degree levels and in the science and engineering work force.

TABLE 1: Science and Engineering Degrees Received by Blacks in Science and Engineering Fields, 1980 - 1981.

Field	Bachelor's	Master's	Doctorates
All S/E fields	18,811	1,787	316
Physical sciences	906	107	28
Mathematical sciences	584	67	9
Computer specialties	786	70	2
Engineering	2,449	260	19
Life sciences	2,649	244	61
Psychology	3,308	424	113
Social sciences	8,129	615	84

SOURCE: National Science Foundation, "Women and Minorities in Science and Engineering," Washington, D.C., 1984.

TABLE 2: 1980 U.S. Population, Science/Engineering (S/E) Workforce, and Doctoral Scientists and Engineers by Race/Ethnicity

Race/Ethnicity	Population	S/E Workforce	Doctoral S/E
White	79.6	95.0	89.0
Black	11.5	1.9	1.1
American Indians	0.6	a	b
Asian/Pac Isl	1.5	2.8	5.6
Spanish Origin	6.4	a	b
Other/No Response	0.4	a	b
	100.0	100.0	100.0

NOTE: Categories with "a" total 0.3% of the 1980 Sci/Eng. workforce. Categories with "b" totaling 3.3% of the Doctoral Sci/Eng.

SOURCE: National Science Foundation, U.S. Scientists and Engineers, 1980, NSF 82-314.

In 1980, minority group members represented only 11% of all post-secondary teachers while representing more than 18% of the total undergraduate enrollment and 11% of the graduate enrollment.

Among 1981 college-bound seniors, the percentage of undergraduate minority group students expressing an interest in studying science was in each case less than the percentage of all college-bound seniors expressing an interest in studying science (15% for all, 13% for Blacks, 14% for American Indians, 12% for Mexican Americans, and 13% for Puerto Ricans).

In 1981, Blacks received approximately 4% of the bachelor's degrees awarded in the physical sciences, 2% of the master's degrees, and only 1% of the doctorates in this area.

As important as initiatives at the college and University levels are, they are insufficient to adequately address the present problems. Central to maintaining a sufficent number of scientists and engineers is to take steps to ensure that the pool of pre-college students capable of and interested in pursuing studies leading to scientific and technical careers remain high.

Following World War II, with the establishment of the National Science Foundation (NSF), the federal government clearly accepted a major role in science and engineering education at the college and university levels. With the amendment of 1958, the statutory authority of the NSF (the agency that has assumed the predominant responsibility for science and engineering education) was expanded to include support for science, mathematics, and engineering programs at all levels. Thus, a history of the NSF will contain information on programs ranging from pre-college education to graduate and postdoctoral research and training. Each has been recognized as an important component to developing a scientifically literate citizenry while providing support for a strong educational system for students who pursue careers in science and engineering.

To achieve its goals the NSF has supported university research efforts by awarding grants. Such awards have been made in direct support of research projects and included faculty and student support. In addition, awards were made that included construction of facilities that contained research laboratories and funds to purchase major pieces of research equipment. These grants provided several avenues of funds for the development of a strong research base at a large number of universities.

One program developed by NSF for the purpose of increasing the quality of science education was the Graduate Science Facility Award initiated in 1959. These funds provided for renovation and construction of academic facilities. Through these awards 179 different institutions received a total of $186 million to develop their science capabilities.

Two instructional programs initiated by NSF designed to increase the number of Universities capable of conducting distinguished programs of education and research were the University Science Development Programs (USD) started in 1964 and the Departmental Science Development Program (ISD) started in 1967. Through these two programs NSF had, by 1970, awarded a total of $201.0 million to 85 institutions for development of their science facilities alone.[1] Although these three programs have been phased out by the NSF, they demonstrate what can be done in a relatively short period of time to address problems provided there is a commitment to change the status quo. It should be pointed out that during this period of a great influx of funds into academia to create science and technology capability, minority institutions and minority training were overlooked. This oversight, coupled with long-term historical neglect, has produced the results described.

The enrollment of Black students in pursuit of doctoral degrees in graduate science programs has remained relatively constant in absolute numbers but declined in percentage over the past few years. The Institute for the Study of Educational Policy at Howard University has released data to show that Blacks comprised 5.6% of all graduate students in 1978, down from 5.8% in 1976. In 1978, the proportion of Blacks among full-time graduate students was 4.9%, while in 1976 it was 5.1%. Blacks made up 6.1% of first year graduate students in 1978, compared to 6.4% in 1976. National Research Council (NRC) data show that the distribution of Black doctorates among various fields is uneven. In 1980, 9.8% of the doctoral degrees awarded in education went to Blacks, in the social sciences 4.0%, but only 0.9% in the physical sciences and 1.5% in the life sciences.

When we take a retrospective look, we find that the output of Ph.D. trained minority personnel has not changed significantly over the past 10 years. Specifically, Blacks represent less than 2% of the doctorates in science and engineering; Hispanics less than 1.5% and Native Americans, less than 0.6%. The tenor of the times is embodied in a statement contained in a report on minority students in medical education prepared by the Association of American Medical Colleges and endorsed by that organization's Executive Council. It reads as follows:

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[1]NSF Factbook, Alvin Renetzky, editor-in-chief, Academic Media, Orange, New Jersey, 1971.

"However, the strength of the nation's commitment to equal opportunity appears to be waning and other recent developments (financial aid cut backs, class size reductions, static minority applicant pool, rising tuitions, etc.) appear to threaten this progress."[2] This conclusion was supported by data in the report which show that the number of minority students accepted in the first year medical school class in 1982-83 total 1,451 (10.0%), only 45 more than the 1406 (9.4%) accepted in 1974-75. It is noteworthy to observe that medical schools accepted more than 2,000 additional students between 74 and 82. In 1982-83, medical schools accepted 56 fewer Black students than in 1980-81. Examination of published data for other professions yield the following details:[3]

a) In 1980, 4.7% of all students in law schools were Black, compared with 4.8% in 1972.

b) In 1980, 4.4% of all dental students were Black, compared with 4.9% in 1974.

c) In 1980, 5.0% of all full-time students were Black, compared with 5.5% in 1974.

Part 2 of the same report presents the following highlights:

-TBI's (Traditionally Black Institutions) still graduate over half of the Black bachelor's degree recipients in the 20 states where these institutions are located.

-TBI's graduated one-third of the Black master's and first-professional degree recipients in these stages.[4]

In short, TBI's appear to provide training to minority students in numbers that are disproportionate to the percentage of total students that these colleges enroll. A study completed by Baratz and Ficklen of Educational Testing Services shows that graduates of TBI's obtain employment and enter graduate schools in percentages no different from Black graduates of majority institutions.[5] Black colleges continue to play a significant role in the training of students. We are asking you to support programs that will strengthen our schools and allow us to be even more effective and productive.

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[2]"Minority Students in Medical Education: Facts and Figures," The Association of American Medical Colleges, Office of Minority Affairs, One DuPont Circle, Washington, D.C. 20036, November, 1983, page 8.

[3]"Participation of Black Students in Higher Education: A Statistical Profile from 1970-71 to 1980-81," U.S. Office of Education, Office of the Assistant Secretary for Educational Research and Improvement (NCES 83-327), November 1983, page 8.

[4]Ibid, page 2.

[5]"Participation of Recent Black College Graduates in the Labor Market and in Graduate Education," Joan Baratz and Myra Ficklen, Educational Policy Research Institute, ETS, 1800 Massachusetts Avenue, Washington, D.C. 20036, June, 1983.

The College Board 1985 report, Equality and Excellence: The Educational Status of Black Americans reports the following:

°Although high school graduation rates have improved dramaticially for Black students over the past two decades, college attendance and completion rates have declined for Blacks since 1975.

°Blacks are seriously underrepresented among graduate and professional school students, and Black participation rates in postgraduate education have declined since the early 1970s.

°Blacks have lost ground relative to non-blacks at each stage of the educational pipeline. In 1972, for example, Blacks represented 12.7 percent of all 18-year-olds, 10.5 percent of all high school graduates, 8.7 percent of all college freshmen, and, four years later, 6.5 percent of all bachelor's degree recipients. By 1979, Blacks represented only about 4 percent of all professional and doctoral recipients.

°At the undergraduate level, 42 percent of Black college students were enrolled in two-year colleges in 1980. Persistence rates for two-year college students are much lower than for students attending four-year colleges, particularly for Black students.

°Although predominantly Black colleges enrolled only 27 percent of Black college students in 1980 (as compared to more than 50 percent prior to 1970) and accounted for only 34 percent of all Blacks' undergraduate degrees in 1980-1981, they granted more than 40 percent of all degrees for Blacks in agriculture, computer sciences, biology, mathematics, physical sciences, and social sciences.

°In an increasingly technological society, choice of fields is an important dimension of equality. With respect to math- and science-related degrees, Blacks lose "fields" ground just as they lose attainment ground at several points in the educational pipeline. At the bachelor's degree level, the percentage of those choosing quantitative fields is 60 percent of the national average; at the master's degree level, 40 percent; and at the doctoral level, 33 percent. These choices are affected by two factors: parental education and early educational preparation and achievement.

°Among college-bound seniors in 1981, most Black students had taken fewer years of coursework in mathematics, physical sciences, and social studies than their white counterparts. Even where years of coursework are similar, the content of the courses varies for Black and white students. For example, Black seniors in 1980 were as likely as whites to have taken at least three years of math, but they were much less likely to have taken algebra, geometry, trigonometry, or calculus. Thus, their years of coursework were presumed concentrated in areas such as general math or business math.

°Students in low-income and predominantly minority schools have less access to microcomputers and teachers trained in the uses of computers. Furthermore, students in predominantly minority schools or classrooms are much more likely to use computers for drill-and-practice rather than programming or concept development than students in other schools.

Overall, the evidence suggests that Black students are exposed to less challenging educational program offerings and thus not as likely to enhance the development of higher order cognitive skills and abilities compared to white students.

While there is an urgent need to increase the understanding of scientific and technological issues, science and engineering education activities are at their lowest ebb since pre-Sputnik era. The present posture of the executive branch that the federal government should exercise a reduced role in education hastens the move toward virtual scientific and technological illiteracy and jeopardizes U.S. science and technical preeminence. The report, Science and Engineering Education for the 1980's and Beyond (1980), points out several deficits and problems with the science and engineering educational system in the United States. Although the report is not a consensus document, it, along with other reports like, A Nation at Risk; Who Will Do Science?, a special report by the Rockefeller Foundation; Women and Minorities in Science and Engineering, a report from the National Science Foundation; and Educating Americans for the 21st Century, a report of the National Science Board Commission on Precollege Education in Mathematics, Science, and Technology, point to several deficiencies which must be addressed in an organized, concerted effort to reverse the present trends. Some highlights of these reports follow:

°There are, at present, shortages of trained computer professionals and most types of engineers at all degree levels.

°While progress has been made in increasing the representation of minorities, women, and the physically handicapped, all these groups continue to be underrepresented in science and engineering fields.

°There is an immediate problem of acquisition, retention, and maintenance of high quality faculty to teach science, mathematics, and computer science courses at the pre-college levels. In a recent survey of high schools in 44 states the following was revealed:

-95% of the states reported shortages or critical shortages in physics teachers.

-86% of the states reported shortages of chemistry teachers.

-96% of the states reported shortages of mathematics teachers.

°Nationwide, 50% of the teachers in science and mathematics were unqualified and using emergency certificates.

°Between 1971-1980 there was a 77% decline in mathematics teachers being trained and 65% decline in science teachers being trained.

°Decreasing priority is being given to science and mathematics in the secondary schools of the United States in marked contrast to what is happening in Germany, Japan, and the Soviet Union.

The larger percentage of our nation's youth graduate from high school with no science or mathematics beyond the tenth grade. These students have essentially been eliminated from opportunities for scientific and technical careers and as a consequence decreased the pool from which future scientists and engineers are drawn. Recent studies by the NSF, Department of Education, and National Research Council reveal:

°Only 33 percent of the nation's schools offer more than one year of science and mathematics.

°At least half of the nation's high school graduates have taken only one year of biology and no other natural science.

°At least half of the nation's youth graduate from high school with no mathematics beyond algebra.

°Five million high school students study calculus in the Soviet Union compared to 100,000 high school students in the United States.

°Insufficient attention is given to motivating and providing an adequate education in science for non-science majors at both the pre-college and college levels.

The problems are particularly acute for minorities and disadvantaged members of the population who are located in large urban school systems. Yet, the problem extends beyond minorities. The deficits in the U.S. educational system generate a national problem, related directly to national security and defense and economic productivity and well-being of all its citizens. The volunteer armed forces, for example, attract approximately 300,000 high school graduates annually. Increased sophistication of military hardware and computers require an intellectual capacity based on adequate rudimentary skills in mathematics which must be taught in high school. A model program providing mechanisms for addressing the underrepresentation of minorities in science and technology follows.

An Approach To Enhance The Involvement of Historically Black Institutions In Science and Technology Research and Training

To address the issues and problems identified in the preceeding section, we need a comprehensive program extending from pre-college to the postdoctorate level. The program, at a minimum, needs to address three elements at the college/university level. These elements include institutional development; faculty development; and undergraduate and graduate student development. At the pre-college level the program needs to address pre-service and in-service teacher development and elementary, junior high and high school student development.

The Resource Center for Science and Engineering (RCSE) Program was a model with the potential for long-term success in providing opportunities to address the problem of inadequate opportunities in science and mathematics education for minorities of the nation. Conceived to address the entire spectrum of science and mathematics education, from the pre-college to the post-doctoral levels, the model had broad applicability with many features that were cost-effective and transportable.

The program was successful where other programs failed because it provided a well-defined mission with specified guidelines for proposal development and a staff completely dedicated to the operation and success of the programs; one contact point within the federal agency with which interaction was necessary; and multiple year funding for a broad spectrum of programmatic thrusts.

The RCSE model also made provisions for the following three elements at the college/university level:

1. Institutional development — support of sophisticated equipment not attached to any particular project or principal investigator, funds to strengthen physical resources, alterations and renovation of laboratories, provision of support services, including electronics technicians, machinists, and other centralized resources.

2. Faculty development — provision of up to 50% released time and technical support including technicians and post doctorates.

3. Graduate and undergraduate student development — research assistantships, student travel to scientific meetings, and laboratory visits.

At the pre-college level, provisions were made for the following three essential components:

1. Pre-Service Science and Mathematics Teacher Training Program — opportunities for teacher development activities that focus on innovative and creative approaches in the preparation of pre-college teachers of science and mathematics with emphasis on the preparation of science and mathematics specialists (K-12).

2. In-Service Science and Mathematics Teacher Training Programs/Institutes — to provide for the development of detailed, consistent and in-depth training and updating in content, technology for teaching (computers/telecommunications), and teaching methodology for the current science and mathematics teaching force at the pre-college level.

3. Student Development Programs — Student development programs designed to provide motivational and academic enrichment experiences and at the same time offer opportunities for career explorations. Programs that were developed included the Saturday Science Academy (for elementary and middle school students, grades 3-8), Summer Science, Engineering, and Mathematics Institute (for high school students, grades 10-12), and Research Apprenticeships for Minority High School Students.

Recommendation

A comprehensive model containing the elements described above is the model recommended by the Science and Technology Advisory Committee of NAFEO for adoption by the NSF to provide support for science and technology in Historically Black Institutions. Further, the committee recommends that the adoption of the model be accompanied by a commitment for adequate and consistent funding for a minimum of 10 years. These actions would enhance significantly, the ability of HBIs to contribute to the solution of the Nation's problem in terms of science and technology manpower needs.

Mr. BEVILL. Are there any questions?

Mrs. BOGGS. Xavier University is in my district, Mr. Chairman, and of course I have been very interested in that cooperation, particularly with Atlanta. We are very grateful for your testimony.

One of my other subcommittee assignments has the authority over NSF appropriations, and Congressman Louis Stokes of Ohio and I have been lead persons in trying to make certain that this year, especially when there has been an extension of the definition of minority colleges and universities, to include those that have only 20 percent minority population, that the traditional black colleges and universities will not be adversely affected.

I think that your testimony will help us all, both this committee with energy and in the other committee that is not only National Science Foundation, but National Environmental Protection Agency, and Veterans Administration, all of which have very strong research programs.

I want to help us in understanding the need for greater participation by black constituencies, not just in the universities and colleges, but I am a very firm believer we must start with the youngest children and we won't have to be protective about those who are minorities or those who are female, because the ones who have the capability will simply bubble to the top by the time they are in the third grade, and we will have dismissed these problems, I hope, in the next generation.

We are very grateful for the work you are doing. I hope you will extend my compliments to Dr. Humphries.

Mr. HEFNER. I shall.

Mr. BEVILL. Any other questions?

Thank you very much for a fine presentation.

Mr. BATES. My name is Robert Bates. I am a member of the American Association of Blacks in Energy and I am here in Washington with Mobil Oil. I came simply to supplement the testimony that has been made available to you by Dr. Hefner.

AAB, as we call our association, is really the father of the legislation that has made possible the Office of Economic Minority Impact in the Department of Energy and so we are sort of nurturing along the programs that have been initiated by this legislation and we are simply here to make a point to you that we indeed would like to see full funding for these programs.

It is ironic I think that we are sitting here following witnesses from PG&E and other large corporations that are talking about the same thing that we are trying to talk about as a member, as an employee of the corporation, I see the symbiotic relationship between the colleges and universities and our companies and it certainly ought to be extended to the universities that are represented by Dr. Hefner and by the other members of NAFEO.

So simply put, we would indeed like to have the $2 million for the one program and the $300,000 for the other, and we hope that the members of the committee will see in their wisdom a way to make that money available for us.

Thank you very much.

[The statement of Robert Bates follows:]

TESTIMONY BEFORE THE SUBCOMMITTEE
ON ENERGY AND WATER DEVELOPMENT
HOUSE APPROPRIATIONS COMMITTEE
APRIL 10, 1986 - 2362 RHOB
WASHINGTON, D.C.

ROBERT E. BATES, JR. ON BEHALF OF
THE AMERICAN ASSOCIATION OF
BLACKS IN ENERGY

AMERICAN ASSOCIATION OF BLACKS IN ENERGY

Mr. Chairman and members of the Subcommittee. My name is Robert E. Bates, Jr. I am a member of the board of directors of The American Association of Blacks in Energy and Manager of Chemical and Environmental Affairs and Technology at Mobil Oil Company. My colleague, Dr. Lenneal Henderson is also an AABE member and a professor at Howard University.

The American Association of Blacks in Energy is a non-profit professional association headquarter in Washington, D.C. with fourteen chapters nationwide. It draws its members from major oil companies, utilities, energy related trade associations, small businesses and government agencies. The organizationwas formed in 1977 to expand minority involvement in the development and implementation of government energy policies, to increase minority representation throughout the industry and to encourage young people to seek careers in science engineering and technological fields related to energy. Dr. Henderson and I appreciate the opportunity to join Dr. Fredrick S. Humphries on behalf of NAFEO to testify in support of the budget request for the Office of Minority Economic Impact (OMEI) of The Department of Energy.

The Office of Minority Economic Impact, created under Section 461 of Public Law 95-619, 1978, has played a significant and vital role in advising the Secretary of Energy on the impact of national energy policies on minority communities. It has formulated and implemented national energy programs and regulations regarding minorities and minority business enterprises, provided management and technical assistance to minority educational institutions and businesses, and facilitated their increased participation in the Department of Energy's R&D activities.

Mr. Chairman, a long-term national energy policy should take into account realistic assessments of the impact of energy policies and regulations on minorities. These assessments should be based on accurate regional economic, residential and transportation data. Studies should be conducted to provide policy-sensitive impact assessments and related analysis; incorporate the data and analysis about minorities into assessments for legislative and regulatory actions of DOE; and perform market research, economic and business analysis, and feasibility studies to identify and define economic opportunities in energy research, conservation, and development.

I urge you to grant the request for additional funds for Minority Energy Assessment Model - Data Development and Analysis, Policy Assessments, and Market Analysis in FY 87 to allow OMEI to achieve these stated objectives. The adjusted Gramm-Reduction FY 1986 appropriation of $589,000 is not sufficient to complete these research programs.

Mr. Chairman and Members of the Subcommittee, in the past few years, OMEI, under its Management and Technical Assistance Program, has played the leadership role in the Department of Energy in the significant gains that have been made by minority institutions and business in DOE's R&D procurement activities.

I respectfully call your attention to the fact that historically black colleges and universities (HBCUs), continue to produce an impressive percentage of blacks who obtain baccalaureate and graduate degrees, and postdoctoral training in energy-related fields. However, these institutions have not received the recognition they deserve nor the adequate funding for research, modernization and maintenance of their laboratory facilities and equipment, and other vital infrastructural support. Despite the overwhelming evidence and even acknowledgement that these institutions constitute a national resource that should not only be maintained but nurtured and strengthened to address the problem of black underrepresentation in energy-related fields, the Department of Energy has to date failed to implement an aggressive, systematized approach to improve the capability of the HBCUs to effectively respond to and compete for DOE research and development grants and contracts, and be vehicles for transfer of technical and scientific skills to the minority community and businesses.

Many benefits would accrue to the nation when the best minds and talent among minorities have equal opportunity and access to participate in DOE's programs. Among them are these:

- o Producing of high quality scientists and engineers for careers in government, industry and business;
- o Improving capabilities to conduct research projects to meet national needs;
- o Enhancing the research partnerships between these institutions national laboratories, and industry research centers;
- o Enhancing the research partnerships between these institutions and small private sector R&D firms;
- o Stimulating the participation of minorities in private sector R&D high technology. This would have a significant effect in minority entrepreneurship in scientific and engineering R&D and inevitably will facilitate the creation of high technology minority private business enterprises.

The American Association of Blacks in Energy supports the research and development efforts of the Office of Minority Economic Impact because:

(a) Research and development programs in HBCUs promote cooperation between scientists and professional in minority communities and with the private sector;

(b) Greater private sector/minority community joint ventures and cooperative programs result in reduced dependence by minority communities on governmental support; and

(c) Most importantly, research and development activities within minority communities and between minority institutions and industry generate expanded business and industrial activity. Of course, expanded business and industry productivity and gross receipts result in more corporate and individual income tax revenues, certainly a more positive and enduring contribution to federal budget deficit reduction than massive spending reductions in this area.

Most valuable to the nation, particularly to minority communities is the role of the Office of Minority Economic Impact in brokering both scientific and business opportunities not only for HBCUs but other private sector institutions in minority communities such as non-profit organizations and small business. Mr. Chairman, AABE cannot emphasize enough its belief that such brokering results in minority based private sector initiatives capable of both institutional self-reliance in minority communities and the eventual generation of revenue-generating business and scientific activity throughout the nation. Support of a $2.8 million budget for OMEI insures this economic multiplier effect. What a small price to pay for such an enormous yield in benefits.

It is also important to emphasize that most of AABE's members work in the energy industry. They fully appreciate the need to promote fiscal responsibility, curb unnecessary government regulation and promote tax reform. As AABE analyzes fiscal issues, it brings to bear unusual talent and expertise. Consequently, AABE supports full funding for the DOE Office of Minority Economic Impact as a result of its expert belief in its role as a major financial investment in the nation's economic, scientific and fiscal future. Federal monies invested in the work of the OMEI yeild many benefits to all citizens in the long-run. In the short-run they sustain HBCUs, minority and majority business relationships that are educationally and financially productive for us all.

Mr. Chairman, I know this is a time of budget restraint and we all have to bear our share of cuts to reduce the deficit. However, the $402,000 and $785,000 provided for the Minority Honors Training Programs and the Minority Educational Institution Assistance respectively in FY 1986 already reflect a significant Gramm-Rudman reduction. Providing only $121,000 for the Honors program in FY 1987 and no funds for the Minority Institution Assistance program will be a tragic mistake. I request you to consider at least $300,000 and [redacted] respectivley for these programs in the Department of Energy's FY 1987 appropriation.

AABE conducts ongoing assessment of energy-related issues and institutions, particularly as they affect minority communities. Consequently, we would welcome an opportunity to provide you with additional information and commentary on the need for continued financial support of the OMEI, as well as related matters as your committee requires. Please contact us as you continue deliberations on this vital component of the Department of Energy Budget.

Thank you.

Mr. BEVILL. I am sure this subcommittee would like very much to do that and I hope that we can do it. We will certainly give it every consideration we can.

Mr. BATES. Very good. Thank you for your time.

THURSDAY, APRIL 10, 1986.

CENTRAL ARIZONA PROJECT

WITNESS

ROBERT A. WITZEMAN, MARICOPA AUDUBON SOCIETY

Mr. BEVILL. Dr. Witzeman.

Mr. Bevill, and members of the committee—especially my own Congressman, Mr. Rudd—it is a real pleasure to be here today and I would like to clarify some issues on how much water the Cliff Dam stores. The difference between the amount of water storage, between plan 9 and 6, that is the plan without the Cliff Dam, is 16,000 acre feet of water. How much is 16,000 acre feet of water? Well, it is enough, if you use water the way Tucson does, for 80,000 people. If you use it the way Phoenix does, twice that much. Per person, why it is enough for 40,000 people. But the point isn't how much water it would give per person, the problem is that real estate development that the dam engenders in its master plan requires using 21,000 acre feet of water. So that the dam will bring a net loss of 5,000 acre feet of water to Arizona.

One of the reasons that the real estate development that the dam engenders needs so much water is because they have to line the entire river bottom with grass, they can't have gravel. If they line it with gravel, it would have to be very broad. And in order to get the real estate benefits of the enhancement of putting buildings and business down in the river bed, you put grass there.

The master plan that has been approved by the cities of Mesa, Tempe, and Phoenix also allows for ornamental lakes. That is another reason why it uses so much water and, in fact, it is the equivalent in ornamental lakes of 1,000 football fields, if you consider a football field area between the goal posts.

Here we are out in Arizona, in the West, and we are putting ornamental lakes, 1,000 football fields' worth, down in the river bed, also putting Bermuda grass down there. That is why, as I say, this real estate project that the dam is being built for uses more water than the dam generates.

Now, ostensibly the bureau says that they need it for safety, there is a safety purpose for having built Cliff Dam. I was a member of the Governor's Task Force, of some 30 members, and while we were seeing the engineers from the Army Corps, who are hired by the bureau, hired by the Corps, and the Corps in turn went to the private sector, to one of the largest dam building outfits in the nation, and says safety could be had on the Verde River for $9 million. The bureau's safety can be had on the river for $280 million. There is a great disparity there between the private sector and the government.

What the private sector has proposed to do is build around the Bartlett Dam and we have a dirt dam upstream. What if it fails? In

a recent dam safety study, my testimony points out that the bureau says that if the upstream dam were to fail, it would not be a domino effect on the downstream, instead, it would only in the maximum probable flood—that is the largest flood that can ever occur—allowing two percent more water to go down the river at Bartlett when the dam fails. That is the dirt dam—if it fails. So the point was the Camp, Dresser and McKee solution of $9 million was better than the $290 million the bureau wanted to spend.

On the flood control benefits of Cliff Dam, I went downtown to the city and asked what buildings, what homes, what businesses would be flooded today if there were a 100 year flood, which is what you are protecting from the Phoenix area and in most of the United States, and they said there were no buildings down there. In the 1978 and '80 floods we had some 40 buildings, mostly homes, flooded in the Phoenix area. I said what about those 40 homes flooded?

And they said well, when we build all the new bridges, we will build about 14 new bridges, because we had transportation problems, all washed out in the last flood, and basically channelized along the river in those areas. We protect the airport, we protect the holly acres, another area called Allenville downstream. So basically essentially there is no vulnerability, there is no liability at the present time in the 100 year flood plain.

If we do plan 9 it will even be better, because then we will have a flood plain of 170,000 rather than 215 that we have today. So I would encourage plan 9 to be adopted by this committee. This year for the first time, $300,000 in funds are going to be going toward Cliff Dam. This is the first time Congress has ever done this. It is time we say to not waste any more money on something silly when you can have dam safety for $9 million and the real estate development project uses more water than the dam generates and you could have that and there is no flood control problem.

One last point I would make, and it is a real pleasure to be here with Mr. Rudd, and I had always heard that it is wonderful, there is going to be 200,000 acre feet of storage in the dam.

Mr. BEVILL. Can you wrap it up?

Dr. WITZEMAN. Yes. Two hundred thousand is a wonderful number, but it isn't the annual yield. The annual yield is 16,000 acre feet. The point is, you have dry years and you have wet years. You get as much as you can. Like we would have had 25 years in a row with not a drop of water that would have been stored from Cliff Dam between '40 and '65. You see, that is the reason we build a big dam and even then we only get 16,000 acre feet out.

Mr. BEVILL. Thank you very much.

Mr. RUDD. Mr. Chairman, thank you.

Bob, welcome to Washington. You know, I am always surprised that you hadn't been there when we were addressing these matters because you had been busy at home and I recognize that. Anyway, welcome.

Dr. WITZEMAN. Thank you.

[The statement of Mr. Witzeman follows:]

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TESTIMONY OF ROBERT WITZEMAN, M.D., MARICOPA AUDUBON SOC. APR. 10, 1986

HOUSE ENERGY AND WATER DEVELOPMENT SUBCOMMITTEE ON APPROPRIATIONS

Arizona's master politicians appear to have outwitted Gramm-Rudman. They increased their Central Arizona Project (CAP) allocation in Reagan's budget from $173 million last year to $203 million for the coming fiscal year.

The President has also increased the Bureau of Reclamation budget this coming year by $152 million (from $782 million in FY 86 to $934 million in FY 87), while cutting the Fish and Wildlife Service and National Parks budget $110 million. This action finds a perfect parallel in the Bureau's new three-dam, Plan 6 proposal of the CAP.

It is a project which destroys Bald Eagles and compels the rest of the nation to continue to finance the growth of the nation's second fastest growing state. The Bureau of Reclamation, now with the support of the President, has become the ultimate mechanism for transferring subsidies, from the East, Midwest and South, to the West.

Arizona is acting out a clever charade by supposedly offering to costshare $371 million local dollars or 22% of the $1.7 billion final cost of this three dam package. In truth, Arizona would only be costsharing about 12% because half of Arizona's share would come from the revenues of federal Reclamation dams and power plants built by the U.S. taxpayer. By comparison, Army Corps water projects, in the House Omnibus Water Projects Bill, will require 25-30% local costsharing.

This allows Arizona to thumb its nose at Gramm-Rudman, while being able to accelerate federal funding for the construction of a $1.7 billion three-dam package designed to subsidize Arizona's real estate, high tech, cotton and feed grain industries.

CLIFF AND ROOSEVELT "REAL ESTATE" DAMS

Two of the dams (Cliff Dam and raising Roosevelt 70 feet) would create thousands of acres of industrial, commercial and residential riverbottom real estate in the heart of downtown Phoenix, the nation's second fastest growing city. This development would be crammed with luxury hotels, golf courses, high tech industrial parks- and homes for 40,000 unsuspecting 'back-east' newcomers who would be moving down into the floodprone arroyo of one of the West's largest rivers.

The riverbed developers propose to cover that entire desert riverbottom with thousands of acres of water-wasting Bermuda grass and ornamental lakes- which would use as much water as a city of 100,000.

Decades of giveaway-priced federal water projects in Arizona have spawned a cycle of water waste, followed by artificial shortages, followed by more federal projects. These developers plan to lure easterners to a dry desert riverbed which has been totally covered from bank to bank with bermuda grass, and interspersed with artificial lakes with a surface area greater than 1000 football fields.

The federal government will also be entering into an economically disastrous flood control undertaking. By their own official documents they admit that if Phoenix sustained a flood such as it had near the turn of the last century, major portions of the homes and businesses of that scheme would be inundated- and this assumes that all of the proposed Plan 6 dams would be in place.

Guess what state will be the first to ask Congress to pay the inevitable flood damages?

NEW WADDELL DAM: MORE SURPLUS CROPS FOR ARIZONA'S 'AG' WELFARE QUEENS

The third dam, New Waddell, in this Plan 6 package would provide water to allow Arizona's already astronomically subsidized Reclamation irrigators to continue to put the rest of the nation's farmers out of business. With subsidies like this Arizona's producers will continue to compete unfairly against midwestern grain farmers, cotton farmers in the South, and all dairy farmers. There is a common misconception that most of Arizona's crops are vegetables and citrus. In fact, 85% of our croplands are wheat, feed grains, forage and cotton.

Arizona's Bureau of Reclamation welfare queens lead all states in the highest per farm federal subsidy. Dr. Thomas Power of the Economics Department of the University of Montana calculated that CAP brings an average water subsidy of $1,833,000 to each Arizona farmer-recipient.

If one omits Arizona's minifarms and only includes those farms which produced 97% of the state's food and fiber, those 2050 farms enjoyed a $204,390 per farm average **net cash income** and a $52,521 per farm average federal subsidy payment. Subsidies for Arizona's Reclamation welfare queens were much higher since the previous figures included cattle ranchers who do not receive income price supports. Arizona's dairy farmers are No. 1 among all the states in average per-farmer payments at $226,978.

Last year Arizona's 1600 farmers who received federal deficiency payments averaged $29,348 each, compared to the national average of $5000 per farmer. Based on current crop patterns, 70% of the irrigation water from this New Waddell Dam (and the CAP agricultural boondoggle, for that matter) would grow surplus crops which the fed pays farmers not to grow. Thus do these Reclamation programs work at cross purposes to our very costly federal crop reduction programs.

Arizona agribusiness often repeats the meaningless claim that they produce the highest yields of cotton per acre. This is irrelevant in a capitalist economy where **it is the cost of producing a pound of a commodity which determines whether it should be produced.** A greenhouse in Alaska could grow even higher per acre yields. But it would cost more to produce there- just as it costs more to produce them in Arizona than elsewhere in the nation if one factors in the Bureau of Reclamation water and power subsidies.

CLIFF DAM AND THE DAM SAFETY HOAX

Cliff Dam, like its ill-fated predecessor, Orme Dam, has engendered much emotionalism- and misinformation. The price tag for Cliff Dam, with its unnecessary flood control and miniscule water supply, is $385 million in today's dollars and would be $833 million upon its completion.

Any discussion of Cliff Dam must be prefaced by the admission of its builder, the U.S. Bureau of Reclamation, that there are alternatives.

In the Final Environmental Impact Statement on Orme Dam alternatives, the Bureau included Plan 9, which essentially consists of constructing auxiliary gated spillways at both Horseshoe and Bartlett dams on the Verde River and raising Bartlett 27 feet. This will make these dams safe, the prime justification for Cliff, at a cost of $279 million. The Bureau selected the Plan 6 alternative which includes the expensive Cliff Dam.

Herein lies the basis for the lawsuit filed by virtually every major environmental group against the dam. The draft impact statement's five action alternatives all included Cliff Dam. While the Bureau knew about Plan 9 at that time they chose not to include it in the Draft Environmental Impact Statement where it would be subject to comment and scrutiny by both the public and the governmental agencies.

When discussing dam safety we must ask "how safe is safe?" Virtually everything we do has some risk attached. We could drive safer cars, for instance, but this would add to the cost. Local governments do risk analysis for us by deciding that our drinking water can contain a certain percentage of toxic materials that will only cause a few deaths per so many millions of our citizens. To do otherwise would greatly increase our water costs. Local politicians feel that money could be better spent fighting crime, and providing health care, transportation, etc, and are understandably reluctant to increase our taxes. Nationally our politicians seem less concerned about spending our money as the deficit illustrates.

The Bureau of Reclamation, which desperately needs new projects to build to prevent its own extinction, has opted for essentially zero risk reference to dam safety. They are protecting dams from a computer-derived probability flood- which some would call a "Noah" flood. Will we next be spending our tax dollars to protect the public from meteor showers?

Since Arizona is committing hundreds of millions of local tax dollars to fund Plan 6, perhaps we would be willing to accept a more reasonable level of risk.

First let us look at Horseshoe Dam. We are told it is "unsafe," yet SRP's "paleoflood" analysis indicates it would not have been overtopped by any event which has occurred at least since the time of Christ. Its spillway capacity is at least 300,000 cubic feet per second (cfs) and the largest paleoflood was 196,000 cfs.

Horseshoe Dam is a tenth the size of Roosevelt Dam and 58 miles upstream of Phoenix. Its failure during the "Noah" flood would add less than 2% to the downstream flow at Bartlett Dam, according to the Bureau's 1984 Dam Safety report. While the Bureau also admits it can be made "safe" for $163 million, such an investment cannot be justified.

The Bureau's justification of Cliff simply assumed Horseshoe's failure would endanger Bartlett Dam downstream and the failure of both dams would result. To avert that domino effect, we need only raise Bartlett and add a gated auxiliary spillway. That would cost $116 million, less than half Cliff's pricetag.

Since we are here spending local tax dollars, let us consider an even more cost-effective solution. For this we look to private industry. In 1981, the national engineering firm of Camp, Dresser and McKee analyzed the safety problem and concluded that Bartlett could be made safe for less than $20 million. This would entail construction of an emergency auxiliary spillway just south of the existing dam, which would operate during an extreme event, leaving Bartlett intact.

The Corps of Engineers has used this approach on the Mississippi River levee system, and the Aluminum Company of America has built this type of spillway in connection with dams in the southern Appalachians- but the Bureau has rejected it. They would rather waste tax dollars and flood eagles.

THE CLIFF DAM WATER STORAGE HOAX

Bureau hydrologists say the difference in water yield between Plan 6 and Plan 9 is 16,000 acre-feet. Since the Rio Salado Development District, in their master plan, officially proposes to use 21,100 acre-feet for their water-wasting ornamental lakes and grass, the dam, in reality, means a net loss of 5100 af of water for Arizonans.

Cliff's water simply squanders federal dollars to maintain a lavish, water-profligate lifestyle in the Arizona desert. Do the taxpayers in the rest of the nation believe they should pay so Arizona can live high on the hog- in denial of the realities of their arid environment.

The Rio Salado floodplain developers say they are 'only' using wastewater effluent. Effluent is a key future water supply for the Valley and will be one of the most valuable trading cards as central Arizona cities grow. These cities can trade it with Indians and agriculture for potable supplies, to cool power plants, and for existing parks, golf courses and urban developments.

CLIFF DAM'S "FLOOD CONTROL" PURPOSE

The dam is being built so that a posh development of luxury hotels, condominiums and commercial and industrial parks can be erected deep in the floodplain of a presently vacant riverbottom.

Because the dam will make it possible for developers to move into a presently vacant floodplain, the dam will greatly increase the liability to the community: to the local city and county governments which condone and approve this dangerous floodplain-sited extravaganza, and to the Salt River Project (SRP) which will operate the flood control dams. SRP's track record in this regard is already tarnished as shown by the legal settlements they have paid relating to the 1978-80 rainstorm events.

The Valley has now solved the flooding problem of a few years back. 15 large bridges were built, levees built around one community, another relocated, and the airport channelized.

If Roosevelt were raised as in Plan 9 and Cliff Dam was not built, the community (currently with a 215,000 cfs, 100 year floodplain) would have protection from the 200 year flood as well as any historic storm, e.g. the 1891 flood. Under Plan 6 the community would sustain devastating damages from such an event. Plan 6 would encourage moving people into the dangerous 55,000 cfs floodplain. And that 1891 storm would have dumped at least 93,000 cfs upon it. If the present floodplain development is kept just as it is today when Roosevelt Dam is raised, all 15 of the bridges, the homes and private structures, and the airport would remain undamaged in both the 100 and 200 year event. So who needs Cliff Dam for flood control? Those who trumpet the need for "flood control" are really saying they want windfall profits for local floodplain landowners and developers at the taxpayer's expense, and at the expense of further stress on the national budget.

SUBVERTING THE INTENT OF CONGRESS

Orme Dam, as authorized by Congress in 1968, was a smaller dam and only cost $42 million or 5% of the CAP. Orme was intended as a regulatory or water storage facility. Flood control was only 1.5% of the total CAP cost, and Orme then had only 670,000 acre-feet (af) of flood control space. Today's Orme alternative contains a whopping 1,300,000 af of "flood control" space and costs 30% of the CAP. This shows how politically-muscled floodplain developers can work with a federal agency to sneak their shenanigans past an unwitting Congress.

ENVIRONMENTAL IMPACTS OF CLIFF DAM

Cliff Dam would eliminate ten magnificent miles of the Verde River out of 50 miles of Arizona's only "wild and scenic" river. Once the dam would begin silting-in or once its floodprone real estate scheme was flooded, there would be a clamor for another dam on the Verde.

Cliff Reservoir would permanently destroy seven miles of prime eagle habitat and variously inundate another 20 miles upstream. 25 miles of eagle habitat downstream from the dam would be degraded by channel stagnation due to Cliff's flood control function. This would impact four pairs out of some thirteen pairs of Bald Eagles which produced young in Arizona last year.

Most of the Sonoran Desert streamside habitat of these eagles has already been destroyed by federal dams and diversions.

Arizona's Bald Eagles are specially adapted for desert survival, nesting in mid-winter and fledging their young before the summer heat. They are the only self-sustainging population of Bald Eagles in a seven-state, 1000 mile diameter circle of the Southwest. Having small body size and eggs, they do not interbreed with the larger northern populations of eagles which winter-over in Arizona. Arizona's eagles prefer streams rather than Arizona's devegetated, widely fluctuating desert reservoirs. With such a tiny gene pool for this unique, desert-adapted population, Cliff Dam's reduction in the few remaining miles of preferred riparian habitat is brinkmanship with extinction.

In summary, the outrage of Cliff Dam is that the federal government is building a dam to make possible a water-wasting, floodprone commercial real estate scheme for feeding the growth machine of one of the richest, fastest-growing cities in the nation. And more tragically, the dam commits the nation to the death of the last major continguous, free-flowing Sonoran Desert river in the U.S. and the oblivion of a unique population of desert-adapted Bald Eagles.

Mr. RUDD. Bob, I would like unanimous consent to place a statement in the record, Mr. Chairman.

Mr. BEVILL. Without objection, so ordered.

Mr. RUDD. Now, you and I have never agreed on many of these matters, but I certainly respect the effort that you make and that is your right and privilege, and I would defend that to the death, believe me, I would. You fail to realize the reason we build these dams is not to grow grass, and it is not to develop real estate, it is to keep people alive, and we are not going to have enough water by the year 2000. I won't say any more about the statistics that I gave to your colleague a little earlier on water flows and what takes place there, but without additional water, we can't exist as we do exist. We do have a beautiful community, it has a lot of desert landscape, we have a lot of things that we can enjoy, but if we don't have water to drink and to live with, we are not going to have any of those things. That is the purpose of the dams.

I would just like to say that Cliff Dam was a second poor alternative to what was then Orme dam, because Orme Dam would have stored water during periods of drought, and Cliff Dam will store about a tenth as much as Orme Dam would have for the purpose of drinking water for the citizens of the state.

You said something about agriculture. It is not guaranteed one drop of water by anybody. If it is available, they will get it. But in doing things for real estate, and for agriculture, first you build dams, then they serve agriculture, and then as people move in, that goes from agriculture to industrial use, and commercial use, and for the urban population. That is the reason that we need these things.

Plan 9 was considered and rejected. So there is no need for it to be considered again, because if you keep considering it, you are going to go back and consider all nine plans I suppose continuously. In any case, I would be very pleased, in fact I request that you give me some sources for the outrageous statements which appear in your statement here. You don't give any sources—I appreciate it if you would—and send them to me personally. I will be grateful for that and certainly the committee will, too, I am sure.

What we are really worrying about is the increased population in Arizona and I thank you for appearing before the committee today and it is good to see you. I hope you will have a safe, nice trip home.

Dr. WITZEMAN. Thank you for the very thoughtful, well considered remarks and I, too, am concerned about the safety and the threat of life, and the reason we build dams is to protect lives, and that is what worries me so much, because if we would have a flood such as occurred in 1891, the Rio Salado real estate development would have twice as much water going through it. The Bureau of Reclamation tells us it would be built to withstand because the 200 year flood is 93,000 and the project is built down to the 55,000 flood plain, so there will be a tremendous loss of life, and since there is an airport where there is a lot of noise, they will have double-leaded glass windows. When helicopters come around with loud speakers to try to have people evacuate their homes, they won't be able to hear them.

Mr. RUDD. That isn't accurate. We have had floods up to 130,000 feet in recent history—that is cubic feet per second. This is not a debating forum or anything like that, the problem of whether we are going to build Cliff Dam or we are going to save eagles or anything like that, I am in favor of that, I admire you for what you do as an ornithologist, but you know, when it comes down to whether we serve human beings or serve eagles, why I for one am going to choose human beings, and I think that most of the people there when we reach that year 2000 with four million people, we are going to have to take care of them, and we have to find ways to do it.

Dr. WITZEMAN. Mr. Rudd, I will conclude, if I could.

Mr. BEVILL. If you want to put in another statement——

Dr. WITZEMAN. The real estate development would have 55,000 cubic feet per second flood plain and therefore, people will be flooded.

Mr. MYERS. What kind of doctor are you?

Dr. WITZEMAN. I am not an ornithologist, I am in private practice. I have been in private practice in Phoenix since 1958, and I hope I can live there and see the community grow. I think the growth of the community is very important and the growth is something that I am very much for. My practice has gone along with growth just as all the rest of the community has and I have nothing against growth and in fact, I look forward to it.

Mr. MYERS. We'd like to sell you water from Indiana.

Dr. WITZEMAN. If we want more growth we can buy five cotton farms and get as much water as the Cliff Dam.

THURSDAY, APRIL 10, 1986.

THERMAL STORAGE

WITNESS

C. EVERETT BRETT, DIRECTOR, NATURAL RESOURCES CENTER, UNIVERSITY OF ALABAMA

Mr. BEVILL. The committee recognizes Dr. Brett. We are pleased to have you. I see you are from the finest school in the United States.

Dr. BRETT. That is right.

I am Dr. C. Brett, I am Director of the National Resources Center in the School of Mines and Energy Development at the University of Alabama. I am here to recommend funding for the FY 87 Department of Energy R&D appropriations for thermal storage at a modest level in 1986 appropriations.

Heat and chill can be stored, we have done it in a project we have at the university. We are perhaps the only ones in the world that have done it in a commercially available way. We have two air conditioning systems, one in a department store at the University Mall in Tuscaloosa, built by private money, and a system in the student recreation center at the university that was built by the university. These systems are 150 ton systems and they reduce the use of electricity by 50 to 80 percent on an annual cycle.

It is a very simple technology in concept. We take water out of the ground in the winter time, expose it to cold air, put it back in the ground and recover it the next summer for air conditioning. There are no chillers in the system. It eliminates all the complexities that are associated with the usual air conditioning systems.

There is a considerable amount of work yet to be done. There is a big step between academic understanding of systems and commercialization, as you well know.

We designed the system for the General Motors carburator plant in Tuscaloosa, a 700 ton system. They incumbered the funds for the project, have done all the site testing. They are currently holding off doing the project because they are interested in having the Department of Energy participate by monitoring the system. We do not want to take the risk of installing the system if there is not some way to tell how it is operating and be able to modify an experimental system like this as it gets in operation.

The Veterans Administration has sent one of their engineers to Tuscaloosa. They are also considering installing a major system in the Veterans Administration hospital in Tuscaloosa. They have conceptually approved building a system like this. You have to remember, these are experimental systems.

The impact of this technology could be significant. General Motors Corporation has already stated to us that with successful experience in the Tuscaloosa plant they would seriously look at using this technology throughout their corporate facility. The Veterans Administration has taken the same position, that if the technology is proven out in the Tuscaloosa area, they again would look at all the facilities in the VA throughout the country.

If you extend this to all the military bases, any of the large facilities that your imagination can develop, you can see that the direct benefit to the Federal Government internally would be significant. We are talking about a 50 percent reduction in air conditioning costs in this particular system.

A little history. In FY 81 terminal energy storage had $23.6 million and in the Department of Energy the battery program had $27.3 million.

In FY 85 thermal energy storage had $2.3 million, the battery program $16.8 million.

In FY 86, thermal energy storage had appropriated to it $7 million in language of the bill, but there were $3 million in the tables. The Department of Energy committed $3 million and ignored the $7 million appropriations.

In fact, only $1.6 million actually went to thermal energy storage because the rest of it went to other programs internally.

The FY 87 budget currently is zero for that program.

We recommend that $6 million be appropriated for FY 87 for the national program for thermal energy storage. That is '85 percent of the appropriations for FY 86.

Further, we recommend that industrial storage be appropriated $2.6 million, seasonal storage $2 million, and biannual storage $1.5 million, and further, that the language of the appropriations prevent transfer of those funds to other programs.

It would also be beneficial if the Department of Energy were placed in a position of accountability for when the committing of

those funds, would take place, at what date those funds would be committed, and how those funds were used.

My final point, what happens if we don't do this, besides just the loss of technology and capability for savings?

The Swedes, Germans and Japanese have all taken notice of this technology. They are under energy and economic pressure. They are in the process of developing it. We have given it to them. We go around and give papers everywhere and they are very familiar with it and they will very soon be in a position of exporting this technology to the United States. We would not like to see that.

Thank you very much.

[The statement of Dr. Brett follows:]

WRITTEN STATEMENT

by

Dr. C. Everett Brett, Director

Natural Resources Center

The School of Mines and Energy Development

The University of Alabama

to the

Subcommittee on Energy and Water Development

House Committee on Appropriations

Hearings on Fiscal Year 1987 Appropriations for the

Department of Energy Thermal Energy Storage Programs

April 10, 1986

This statement pertains to FY 1987 Department of Energy R & D Appropriations for Thermal Energy Storage Research. The Natural Resources Center at The University of Alabama strongly endorses the continuation of thermal energy storage research at a modest level of funding and offers recommendations whereby an effective R & D program can be continued at a funding level below that appropriated to The Department of Energy in FY 1986.

The Natural Resources Center has been responsible for alternative energy and environmental research since 1969 and as a division of the School of Mines and Energy Development since 1978. The Natural Resources Center develops, conducts, and supports alternative energy and environmental research which responds to state, regional, and national needs. To accomplish these goals, the University of Alabama for many years has committed substantial funds and human resources to research directed at finding ways of reducing the use of and conserving the nation's energy resources and reducing the environmental impact of producing energy. The Center in cooperation with the Department of Mechanical Engineering has been conducting research in thermal energy storage in aquifers since 1977.

Thermal energy can be stored seasonally in aquifers either as heat for winter heating or as chill for summer air conditioning. Significant attention has been given by the Department of Energy since 1976 to the storage of hot water in aquifers for heat recovery on an annual cycle. Less attention has been given to the prospect of storing cold water generated in the winter time for summer air conditioning. The Natural Resources Center has concentrated its efforts on research pertaining to the storage of chilled water for air conditioning because of the high electrical energy demands for air conditioning in the South.

Air conditioning occurs throughout the year in large buildings, even in the cold northern latitudes of Canada because of the internal loads generated by large major buildings. Aquifer air conditioning consists primarily of pumping groundwater in the winter from one set of wells, cooling it by exposure to cold air temperatures and returning it to the aquifer in a second set of wells. Flow between the two sets of wells creates a storage volume that contains the chilled water on an annual cycle. In summer, the flow is reversed and the chilled water is pumped back to the surface and used for air conditioning buildings. After the water passes through a building and is warmed, it is pumped back into the original set of wells and the cycle is subsequently reversed.

Our results through theoretical modelling and through experience with prototype air conditioning systems constructed in the Parisian Department store in Tuscaloosa, Alabama, and in the University of Alabama Student Recreation Center show that a minimum of 50% of the air conditioning energy and cost can be saved as compared to conventional electrical air conditioning systems. The cost of purchasing and operating expensive chillers is eliminated. The main components of the system are the cooling towers or cooling ponds used to chill water, the wells, pumps, the connecting piping, the aquifer itself, and controls to operate the system. Our studies show further that in some systems as much as 80% of the cost of electricity and energy can be eliminated, and that 70% of the nation's population is located in areas where aquifers are available for thermal storage.

In addition to the aquifer air conditioning systems constructed for Parisian Department Store and the University of Alabama Student Recreation Center, a system has been designed by the University for the General Motors Rochester Carburetor Plant in Tuscaloosa for which bids have been received. The front end costs as indicated by the bids show a payback of 6 years. Currently, the project is in a holding status because General Motors has a payback limitation of 4 years for all energy conservation systems. The system has since been redesigned incorporating the experience gained in the original design and a three to four year payback is expected for the new design. However, General Motors Corporation, although it has encumbered funds to build the system (700 tons @ $250,000), is reluctant to go forward with the construction unless the Department of Energy is willing to participate in a monitoring program to evaluate the operational effectiveness of the system. They feel there is too much risk to build the system without a means of evaluating its operation. Should the system prove effective, as anticipated, General Motors Corporation has indicated that they would have a strong interest in using this energy conserving technology throughout their industry. This would be an outstanding opportunity for joint federal and private enterprise research.

The aquifer air conditioning systems at the Parisian Department Store and at the University of Alabama Student Recreation Center were constructed without federal funds. The system at the General Motors Carburetor Plant would also be constructed solely from private industry resources.

In the late 1970's DOE constructed a large seasonal storage aquifer air conditioning system in New York which ultimately proved to be a failure. Because the Parisian system worked, DOE invested a modest sum of

money for monitoring the system. During the course of this monitoring the Student Recreation Center System was constructed and has been operating successfully for over four years without serious problems. DOE is currently investing a modest sum in monitoring the Student Recreation Center but at a level that limits the amount of information that can be gained. The University took some risk to construct this system, and now we are learning why it is effective when earlier systems have failed. We now know that the systems will work and that the cost savings are real, and we are continuing to develop designs that minimize front-end costs for construction to make the payback increasingly attractive to industry.

In addition to the aquifer air conditioning system just described the Veterans Administration Hospital in Tuscaloosa is planning the renovation of several of its buildings. This renovation includes energy conservation modifications and is planned to include aquifer air conditioning as part of the work. These plans have been reviewed by the Veterans Administration Engineering Division in the Washington D.C. central office and have been conceptually approved for the Tuscaloosa site. This would be an ideal site to demonstrate the commercial application of aquifer air conditioning because of the benefits that would accrue to the Veterans Administration and because, in this particular case, four of the treatment buildings would be incorporated into a single system with the storage volume located in a large rectangular area between the four buildings. It would be very beneficial for the Seasonal Storage Program in the Department of Energy to monitor this new system at the Veterans Administration Hospital because it would be a fourth generation design benefiting from the design experience at the General Motors Carburetor Plant. We are reluctant to go forward with the Veteran's Administration System, however, without having learned from the construction of the system at the General Motors Carburetor Plant. Although the Veterans Administration could tolerate a 6-year payback for the construction of their system, it is probable that a system with as low as a three or four year payback could be designed based on criteria learned from the General Motors Carburetor Plant.

The future of aquifer storage air conditioning and the large benefits that can accrue from this commercial energy savings strategy depends on progress developed at the General Motors Carburetor Plant in Tuscaloosa. A successful experience at this plant could result in the construction of aquifer storage air conditioning systems throughout the General Motors organization and similar installations at federal facilities such as VA Hospitals, military bases, and other large federal installations which could significantly reduce the government's energy bill.

In spite of the significant potential for thermal storage to conserve energy on a national basis, the Department of Energy has reduced funding in this area in preference to other programs. These funding reductions have been the result of total program reduction in recent years. For instance, in FY 1981, Thermal and Mechanical Storage (now Thermal Storage) received 23.6 million dollars and the Batteries program received 27.3 million dollars. By FY 1985, Thermal Storage received 2.3 million while the Batteries Program received 16.8 million. Subsequently, DOE recommended termination of the Thermal Storage Program.

Large sums of money have been expended to produce minor improvements in some chemical battery systems as compared to progress made in Thermal Storage. Research in Seasonal Storage, particularly cold water storage in aquifers for air conditioning, has made some large strides on very limited funding. Most of this funding has come either from private enterprise or state sources. So far, only $100,000 has been committed to the current study of cold water storage in aquifers for air conditioning. This is to monitor the system at the University of Alabama Student Recreation Center, which was constructed at no cost to the government. Already, results from this system are providing information which could make the application commercial in two to three years. However, there are still too many unknowns, and enough risk to keep the technology from being attractive for commercial application.

The applications of aquifer storage air conditioning are economically limited to a minimum of about 150 tons. Since the application is suited primarily for very large installations such as hospitals, factories, and major buildings, the savings of natural resources through the reduction of energy usage and the cost savings to commercial users is very large. Although we have some experience in operating these systems at the Parisian Store in Tuscaloosa and at the University Student Recreation Center, and know that they will work, and that the savings are real, we are still learning how to design a system at the minimum front-end cost for construction to make the payback more attractive to industry.

In addition the technology will have the effect of reducing the total demand for electricity, thus limiting the need for new electrical generating equipment and potentially limiting environmental degradation caused by generating electricity (acid rain, etc.). It also load-levels by shifting the demand for electricity for air conditioning from summer to winter.

Before making a recommendation for FY 1987 funding, the funding for FY 1986 should be reviewed. In FY 1986, Congress appropriated $7 million for Thermal Storage in the language of the bill. However, the appropriation tables showed $3 million for Thermal Storage. DOE elected to ignore the $7 million appropriation in the language and chose to commit $3 million as reflected in the tables. Of the $3 million dollars, only $1.6 million was actually committed to Thermal Storage. The $1.6 million was distributed as follows:

Industrial Storage - $300,000 ORNL
Diurnal Storage - $700,000 ORNL
Seasonal Storage - $600,000 PNL

The remaining $1.4 million of the $3 million appropriation was assigned to:

Hydrogen - $1,000,000
Solar Thermal - $200,000 SERI
DOE Discretionary Funds - $200,000

Hydrogen manufacture and solar thermal research are only marginally related to thermal storage research.

Even though the Department of Energy chose to ignore the $7 million appropriated in the language of the bill, that level provides modest funding for support of a viable Thermal Energy Storage Program. With the problems confronting Congress relative to the national deficit and passage of the Gramm/Rudman/Hollings Act, we recommend a FY 1987 Thermal Storage budget of $6 million: this is 85% of the FY 1986 budget as appropriated by Congress in the language of the bill. The recommended level will maintain a steady rate of progress toward the development of a strong technological base and commercialization of the technology which promises a very high energy conservation potential. A core program can be maintained if appropriate adjustments are made which can show significant progress on an annual basis.. We recommend the following specific programs for Thermal Energy Storage:

Industrial Storage - $2.5 million ORNL
Seasonal Storage - $2 million PNL
Diurnal Storage - $1.5 million ORNL

These recommendations, although reduced, are in keeping with the levels appropriated by Congress for FY 1986.

The University of Alabama has been deeply involved in improving our research base in thermal energy storage; hence, we offer our thoughts regarding the priorities for Thermal Energy Storage research as a national program. In addition to our own laboratory and field research efforts, we continuously monitor activities relating to other technologies, research findings, environmental concerns and economic factors that impact the utilization and commercialization of thermal storage technology. We acknowledge that the University has a vested interest in the Thermal Energy Storage Program as described above since we have already made so much progress without federal support. We consider the development of this technology as essential to national energy conservation. The University is not directly involved in the Industrial or Diurnal Storage programs conducted at Oak Ridge National Laboratory, but both programs are extremely important to energy storage and the future of energy efficiency development in the United States. The Industrial Storage Program is working with near-commercial technology to capture waste heat and recycle it in manufacturing processes. As you know, the United States industries are among the most inefficient in the world, and part of their inability to compete worldwide is their high cost for energy. An example is the heat loss in kilns (brick, wood, etc.), foundries, and other large heat demand industries. We are also very impressed with research strides that have been made with Diurnal Energy Storage which involves the load-leveling strategies such as generating ice at night for daytime air conditioning. Much of the diurnal technology is being applied commercially but many new strategies need to be developed and evaluated in this area.

The Natural Resources Center at The University of Alabama strongly endorses continued funding of the Thermal Energy Storage Research Program especially in the areas of Industrial Storage, Seasonal Storage, and Diurnal Storage, and urges the appropriation of a very modest $6 million for its continuation in FY 1987.

Mr. MYERS. Will that system work up north where Mrs. Smith and I live?

Dr. BRETT. There is an experimental system in Toronto and it is a very successful system. Any major building is usually air conditioned the year around no matter where it is because of the internal load and of course this kind of technology is ideal the further north you go where you actually need the air conditioning, because you have a lot of cold weather.

Mr. MYERS. You don't need to be humidifying the system?

Dr. BRETT. It humidifies itself. It is like a regular air conditioner.

Mr. BEVILL. Can you cut the cost 50 percent or is this your goal?

Dr. BRETT. No, the system on the student recreation building reduces the cost of energy to the student recreation building by over 50 percent.

Mr. BEVILL. In cooling?

Dr. BRETT. In cooling. Of course, in the south that is our big problem, air conditioning.

Mr. BEVILL. We certainly appreciate your fine testimony and commend you for the fine work you are doing there in the School of Mines and Research. That is one of the oldest in the country, isn't it?

Dr. BRETT. I think it is, yes.

Mr. BEVILL. It is one of the oldest Schools of Mines in the country, and I know you recently got an award for your outstanding work by the Department of Energy.

Mr. BRETT. That is correct.

Mr. BEVILL. And so we congratulate you and we will certainly do what we can to support your position.

Mr. BRETT. Thank you very much.

Mr. BEVILL. You mentioned these cuts and of course there were general cuts across the board and those that look like the sun is shining on them, you might be interested to know it wouldn't help you any. There are deferrals and reconciliations all pending.

Mr. BRETT. I understand that very well.

Mr. BEVILL. So, the grass is not necessarily greener on the other side on some of those programs.

Thank you.

THURSDAY, APRIL 10, 1986.

SOLAR AND RENEWABLE ENERGY RESEARCH

WITNESS

JAMES F. MANWELL, UNIVERSITY OF MASSACHUSETTS, DEPARTMENT OF MECHANICAL ENGINEERING

Mr. BEVILL. Next we have Mr. James Manwell. We would be glad to hear from you. Your statement will be made part of the record and you may proceed.

Mr. MANWELL. Thank you very much, Mr. Chairman.

I have a prepared statement which has more words than I am going to say in the time available. My name is James Manwell. I am an Assistant Professor of Mechanical Engineering at the University of Massachusetts.

The growth of the use of wind energy for the generation of electricity has been a real success story in the battle to decrease the United States' dependence on imported oil. Wind farms in the U.S. have produced more than 500 million kWh, enough to supply more than 90,000 average homes with power for one year, saving over 900,000 barrels of oil and avoiding the emission of over 500 million pounds of pollutants into the atmosphere.

The impact of wind energy utilization in the U.S. has been significant. One utility that currently has over 300 MW of wind machines installed in its service district has agreements for another 1,584 MW, and is negotiating for another 1,000 MW in September 1985. Improved energy efficiency and the use of alternative energy sources, such as wind energy—perhaps the most significant contributor of all—has helped to decrease the demand for oil and hence helped to decrease the price of oil. I have a lot of information on the programs but I will skip that.

In Britain, support of wind energy has increased over the past decade, because wind energy has become widely accepted as the most promising renewable energy option in that country. University support for wind energy research has been increased by a factor of two and a half times since 1980.

It is as a result of their insistence on quality and research and testing commitments as well as a good historical awareness of previous wind energy developments that the European industry has become so successful and is continuing to grow.

Contrastingly, since 1980 the United States Department of Energy has changed its focus. Presently, neither education nor research in renewable energy is being given a high priority. As a result, fewer funds have been available to support students and research in general at the University of Massachusetts.

There is no reason, however, that the U.S. industry cannot be competitive with the Europeans. The wind industry is an area where many of the high technology developments in which the U.S. normally excels could be applied to great advantage. The European machines work well, to be sure, but they are heavier than they need to be and less efficient than they could be. On the other hand, the American machines tend to the other extreme. They are much lighter and rotate more rapidly, and are often more efficient, but need more maintenance. It has been said that the Europeans think they are building tractors; the Americans think they are building helicopters.

The wind machine industry that can produce the machine that has the efficiency of the American machines and the durability of the European machines will dominate the marketplace. The Europeans, with their commitment to basic research, industry support and regulation, are in a strong position to be able to achieve this goal. For the U.S. to catch up, a few research areas need to be tackled:

Collection and compilation of information on the science and engineering of wind machines. There is no standard text or reference book of information that has up to date data on both European and U.S. machines and systems.

Materials and design philosophy/research. There is a need to develop machine components and design systems that incorporate the

best of European and U.S. machine designs, and U.S. advanced technology such as the advanced materials research at the University of Massachusetts at Amherst.

Systems optimization and testing. This work would require computer modeling and testing to maximize the basic research on materials and design.

If the United States is willing to fund this type of basic applied research, then it may have a good opportunity to regain its competitiveness in this industry. I would be so bold as to compare the American wind industry of today with the computer industry of the 1950s—just as computers were in their infancy and somewhat primitive, so too is the wind industry. From the 1950s onward, consciously and unconsciously, DOD, NSF, and NASA grants and contracts supported the development of the computer industry, support that undeniably contributed to its emergency as a world leader.

I would say in summary, that our department has worked for quite a number of years in this area of wind energy and other forms of renewable energy. We have graduated more than 400 students in a range of courses from solar wind, including 90 higher level graduate students and had over a million dollars in research on wind energy at one time. The program is still there, but the funded research has decreased.

What I would suggest is that as part of the way to help keep the program going is that research continue to be supported and some of these areas include graduate dynamic analysis of speed, of wind machines that will turn at various speeds, look at wind farmer arrays and combined systems with diesel and photovoltaic, for example, such as we heard earlier.

Essentially what I had in mind to say is that we have a good potential in this country, we can do a lot, we have a good industry and we can keep it going, but we need to support research in order to do that.

[The statement of Mr. Manwell follows:]

The growth of the use of wind energy for the generation of electricity has been a real success story in the battle to decrease the United States' dependence on imported oil. Wind farms in the U.S. have produced more than 500 million kWh, enough to supply more than 90,000 average homes with power for one year, saving over 900,000 barrels of oil and avoiding the emission of over five million pounds of pollutants into the atmosphere.

The impact of wind energy utilization in the U.S. has been significant. One utility that currently has over 300 MW of wind machines installed in its service district has agreements for another 1,584 MW, and is negotiating for another 1,000 MW (as of September, 1985). Improved energy efficiency and the use of alternative energy sources, such as wind energy - perhaps the most significant contributer of all - has helped to decrease the demand for oil and hence helped to decrease the price for oil. It is ironic that at a time when our improved inflation picture is due to the increased emphasis on conservation and alternative sources of energy such as wind power, that the wind industry is being considered less economic in this time of plentiful oil at a low price.

At a time when the wind industry is almost a victim of its own success, the American wind energy industry faces internal problems in terms of machine quality and resultant market penetration by foreign made equipment. In particular, Denmark, Holland, and Belgium have taken a substantial share of the market from the U.S. wind machine industry.

At the current time, many American wind machine manufacturers have gone out of business and the shakeout is not yet over. If nothing is done to reverse this trend, within three to five years there may be only a few American machines on the market. On the other hand, the European industry is continuing to expand; in 1985, the Danish industry sold approximately $190 million worth of wind machines, most of them to the United States; and, it is expected that the Danes will do even better next year.

There are a number of reasons for this, but two of them stand out as particularly important.

First of all, the incentives provided to encourage the use of wind energy in the U.S. did not include standards to guarantee that the machines would be reliable and perform as advertised. The result was that a large number of machines were produced very quickly, but they were not necessarily designed and tested for long-term performance.

Many of these machines, in fact, performed poorly or not at all. In Denmark, which is now the world leader in the wind industry, however, machines were required to pass certain basic tests before the purchaser of such a machine could get the government financial incentive (originally a 30% rebate on the cost of the machine). The result was that the Danish machines that came onto the market had passed the tests, performed as advertised, and worked reliably. When potential American purchasers of wind machines saw that they could buy a better machine in Europe for about the same price, they did just that.

A second reason for the success of the European machines is the strong support of the research and testing provided by their governments. This has been especially true in Denmark and Holland. For example, the Test Station for Windmills at Riso, Denmark, has a industry support and regulation program that covers the following areas:

- Standard testing and systems evaluation for licensing wind machines in Denmark
- Development testing of wind machines
- Engineering reviews
- Consultancy to industry
- Consultancy to governmental authorities
- Wind resource assessment
- Research and development

Examples of Research and Development include:

- Rotor blade aerodynamics
- Dynamic loads in the structure
- Fatigue life analysis
- Blake vibration and lifetime testing
- Airbrake design
- Development of measuring methods
- Safety strategy

- Development of licensing criteria
- Wind/diesel systems
- Water pumping wind machines
- Wind machine economics

Other government funded groups, such as the Danish Center for Renewable Energy in Jutland, complement the Riso program by helping local manufacturers improve the designs and manufacturability of their machines. The Dutch also have similar organizations and research facilities, as do many other European countries.

In Britain, support of wind energy has increased over the past decade, because wind energy has become widely accepted as the most promising renewable energy option in that country. University support for wind energy research has been increased by a factor of 2½ times since 1980. A major research effort is also underway regarding the siting of large wind machines offshore for large scale power production. Incidentally, this is a concept pioneered in the United States, particularly by Professor Heronemus at the University of Massachusetts, but one which has been largely ignored here over the past few years. In the British commercial sector there are now 25 companies that manufacture wind machines up to 750 kw capacity. One company has recently (January, 1986) contracted to install 75 machines, valued at $48 million dollars in California. Another area of major interest in the export market is that of the development of autonomous, combined systems for use in developing countries. In these systems, wind is combined with photovoltaic (solar cells) or diesel generators to provide firm power, and in many locations, are cost competitive alternatives to extension of conventional power grids.

It is as a result of their insistence on quality and research and testing commitments as well as a good historical awareness of previous wind energy developments that the European industry has become so successful and is continuing to grow.

Contrastingly, since 1980 the Unites States, Department of Energy has changed its focus. Presently, neither education nor research in renewable energy is being given a high priority. As a result, fewer funds have been available to support students and research in general, and at the University of Massachusetts.

There is no reason, however, that the U.S. industry cannot be competitive with the Europeans. The wind industry is an area where many of the high technology developments in which the U.S. normally excels could be applied to great advantage. The European machines work well, to be sure, but they are heavier than they need to be and less effi-

cient than they could be. On the other hand, the American machines tend to the other extreme. They are much lighter and rotate more rapidly, and are often more efficient, but need more maintenance. It has been said that the Europeans think they are building tractors; the Americans think they are building helicopters. In today's marketplace, the tractor with its high durability is more competitive than the helicopter which captures energy more efficiently from the wind but requires infinitely more maintenance.

The wind machine industry that can produce the machine that has the efficiency of the American machines and the durability of the European machines will dominate the marketplace. The Europeans with their commitment to basic research, industry support and regulation are in a strong position to be able to achieve this goal. For the U.S. to catch up, these research areas need to be tackled:

- Collection and Compilation of Information of the Science and Engineering of Wind Machines - There is no standard text or reference book of information that has up-to-date data on both European and U.S. machines and systems.
- Materials and Design Philosophy/Research - There is a need to develop machine components and design systems that incorporate the best of European and U.S. machine design, and U.S. advanced technology such as the advanced materials research at the University of Massachusetts at Amherst.
- Systems Optimization and Testing - This work would require computer modeling and testing to maximize the basic research on materials and design.

If the United States is willing to fund this type of basic applied research, then it may have a good opportunity to regain its competitiveness in this industry. I would be so bold as to compare the American wind industry of today with the computer industry of the 1950s: just as computers were in their infancy and somewhat primitive, so too is the wind industry. From the 1950s onward, consciously and unconsciously, DOD, NSF, and NASA grants and contracts supported the development of the computer industry; support that undeniably contributed to its emergence as a world leader. Today we face a similar opportunity; one that our European competitors are already moving upon.

Ideally, this country could develop a program comparable to the Danish or Dutch programs in terms of basic research, industry support and regulation. Such a program would allow us to effectively compete in our home market. In developing such a program, the University of Massachusetts at Amherst would be the ideal leader in meeting this challenge.

The University of Massachusetts, Department of Mechanical Engineering has had an extensive program in research and teaching in renewable energy engineering, particularly in wind energy. Operating in close cooperation with the Ocean, Civil, Electrical, and Industrial Engineering and Operations Research Departments, it became an internationally acclaimed center for renewable energy research and education. Students came from all over the world to this University specifically to pursue studies in this area. Over 400 students have taken the Solar Engineering Course since 1973 and approximately the same number have taken the Wind Power Engineering Course. More than 90 graduate students have received Masters Degrees and six have earned their Ph.D.'s while gaining experience in research projects in the areas of Ocean Thermal Energy Conversion (OTEC), Wind, or Solar Engineering. Much of this research was funded by the Federal Department of Energy. Between 1973 and 1983, over $1,000,000 in funded research in wind energy was carried out, as was over $500,000 in ocean thermal, and approximately $100,000 in solar or other renewable technologies such as hydroelectric power.

Recognizing that we cannot create a program comparable to the Danes and Dutch overnight, the University would suggest that revitalizing basic research would be a logical first step towards American competitiveness in the wind industry.

The University of Massachusetts at Amherst would suggest supporting this research:

- Yaw dynamics analysis variable speed turbine study and wind energy from turbulence investigations to contribute to our basic understanding of wind machine operation and facilitate the design of more reliable and efficient machines.
- wind farm array spacing studies to optimize the use of existing machines.
- wind/diesel system analysis to improve U.S. competitive position in the area of exports.

- wind driven water pumping to develop effective machines for the third world.

A second step would be to support the basic research initiative to develop the next generation of machines having the durability of the European machines and the efficiency of the American machines. As I said before, this would entail:

* Science and Engineering Wind Information Collection
* Materials and Design Philosophy Research
* System Optimization Research

A third step would be to integrate these research efforts with industry support and testing comparable to the Danish program.

Attached is a list of proposed research projects in the described areas.

Attachments
aaw

TITLE: Wind/Diesel System Analysis Study

PROPOSED SPONSOR: Solar Energy Research Institute

AMOUNT REQUESTED: $140,000 for 1 year

SUMMARY: The basic objectives of the proposed work are to perform case study analysis using enhanced time-domain systems and component models to 1) demonstrate the potential cost and fuel savings of combined wind/diesel systems, and 2) to identify key operating conditions and hardware design guidelines which may significantly improve system operation and cost effectiveness.

Wind/diesel systems have wide applicability throughout the world where electrical networks are not available. The proposed work will directly help to improve the performance and competiveness of American systems in this area.

STATUS: Proposal is being submitted this month.

PRIORITY: 1/8

TITLE: TECHNICAL/ECONOMIC EVALUATION OF WIND DRIVEN WATER PUMPING SYSTEMS

PROPOSED SPONSOR: U.S. Agency for International Development

AMOUNT REQUESTED: $50,000 for a total of 1 year

SUMMARY:

The proposed research, would assess the viability of wind driven water pumping systems for use in developing countries. Data on previous and currently operating installations in a significant number of developing countries would be collected and evaluated in the light of technical, social, administrative, and economic factors. Based on this data, a state-of-the-art assessment of water pumping systems and system design methodologies would be carried out that would establish what types of wind driven systems have the most promise as well as what has caused the most problems. A following task includes the completion of economic/commercialization case studies for representative water pumping systems in four selected developing countries. The final test would include the development of a recommended plan for future implementation/commercialization of such systems. Thus, the fundamental information gained from this work could lead to machine or system design and implementation improvement that can greatly accelerate the desired commercialization and dissemination of this type of renewable energy system.

STATUS: Proposal was not funded; work not proceeding

TITLE: WIND ENERGY FROM TURBULENCE: CONSTANT SPEED OPERATION

PROPOSED SPONSOR: Solar Energy Research Institute

AMOUNT REQUESTED: $40,000/yr for 3 years

SUMMARY:

It is proposed to investigate the ability of medium size constant speed horizontal axis wind machines to extract power from fluctuating winds. Models would be developed which would consider the fluctuating wind as seen by the rotor blades, the inertia of the rotor and drive train, and the dynamic response of an induction generator hooked to a utility grid. The proposed work would help improve the accuracy of performance predictions of wind machines operating in real wind regimes.

STATUS: Proposal not funded; work not proceeding at this time.

TITLE: WIND FARM ARRAY SPACING STUDIES

PROPOSED SPONSOR: Solar Energy Research Institute

AMOUNT REQUESTED: $75,000/yr for 3 years

SUMMARY:

It is proposed herein to analytically and experimentally investigate the general problem of wind farm array spacing. The power out of a wind farm will be optimized under a variety of wind speed distribution and directions. Predicted optimal array spacings will be tested in the wind tunnel. The problems of cross wind spacing and the nature of the wind field above a wind farm will also be investigated. This work is directly applicable to the installation of large numbers at wind machines in arrays for electric power generation. It will help optimize the use of both land and machinery.

STATUS: Proposal not funded; work not proceeding

TITLE: ENVIRONMENTAL NOISE IMPACT MEASUREMENT AND PREDICTION TECHNIQUES FOR MULTIPLE HORIZONTAL AXIS WIND TURBINE (HAWT) INSTALLATIONS

PROPOSED SPONSOR: Solar Energy Research Institute

AMOUNT REQUESTED: $82,000/yr for 3 years

SUMMARY:

It is proposed to produce a methodology for making reliable estimates of probable noise impacts from wind machine arrays before installation is undertaken. The noise prediction and assessment methodology being proposed would be in a form suitable for use by wind machine manufacturers, wind farm developpers, and community planners. That is, the objective is to formulate a procedure which can be used by non-experts in acoustics and noise control. At the same time, the procedure would be technically appropriate and would provide reasonable criteria for community noise impact assessment. The proposed research would directly contribute to the utilization of wind energy for the generation of electricity in the United States, because it would help to identify and alleviate adverse noise related environmental impacts.

STATUS: Proposal not funded; work not proceeding.

TITLE: VARIABLE SPEED WIND TURBINE FEASIBILITY STUDY

PROPOSED SPONSOR: Solar Energy Research Institute

AMOUNT REQUESTED: $90,000/yr for 3 years

SUMMARY:

The proposed research would determine the practicality of non-grid connected variable rotor speed wind turbine systems by a systematic and coordinated feasibility study. Such machines, if they can be optimized, can significantly outperform, both in energy output and economics, current state-of-the-art constant speed wind machines. The first year's concept evaluation will develop analytical models, based on scientific wind system fundamentals and machine design practices, for five world wide wind system generic loads and applications. It will establish proof of concept of these conceptual systems by answering such questions as: Will such systems produce power effectively? What are the best components? How much improved performance will an optimized system have? Can such systems work economically for world wide applications? The fundamental knowledge gained from this phase of the proposed work is intended to serve as a basis for second and third year efforts that will consider the design, testing and analytical model verification of key components to be used for the most promising systems. The results of this work would be directly applicable to manufacturers of wind machines and systems specification engineers, for both the domestic and export market.

STATUS: Proposal not funded; work not proceeding at this time.

TITLE: YAW DYNAMICS OF THE DOWNWIND HORIZONTAL AXIS WIND TURBINE

PROPOSED SPONSOR: Solar Energy Research Institute

AMOUNT REQUESTED: $40,000/yr for 3 years

SUMMARY:

It is proposed to construct an analytical model of the downwind horizontal axis wind turbine of both the two and three bladed configuration. The model would incorporate all the torques due to variation of wind speed and direction, all the important moments of inertia, non-zero coning angle and non-rigid support pole. Such a detailed model should serve as a design tool for these machines and explain the aberrant yaw behavior of a number of these downwind machines.

STATUS: Proposal not funded; work not proceeding.

TITLE: Field Tests of Wind Farm Array Spacing and Related Micrositing Studies

PROPOSED SPONSORS: Solar Energy Research Institute

AMOUNT REQUESTED: $117,000 for 1 1/3 years

SUMMARY: The objective of this proposal is 1) to undertake field tests to measure the change in power output of the wind turbine array when the spacing of turbines in the cross wind direction is reduced from 1½ to 1¼ rotor diameters at a site where wind machines are already installed. 2) To characterize the wind regiment at a second wind machine array site before and after wind machines are installed.

STATUS: Proposal not funded; work not proceeding at this time. The proposal may have to be modified as installation of machines proceeds on the second site referred to in the summary.

SUMMARY

THE PROBLEM

Although the American wind industry has contributed to the decreased demand in oil and hence the decrease in the price of oil, the wind industry itself is suffering from market penetration by European built machines. The European machines are displacing American built machines because their machines are performing as advertised, and Americans equipment is not, and the European product requires less maintenance than American machines.

With present trends there may be only a few American machines on the market in three to five years, while Denmark sold approximately $190 million worth of wind machines, most of them to the United states in 1985; it is expected that the Danes will do even better next year.

The European machines are outselling the American machines because of the commitment of European governments to:

- basic research and development of wind machines;
- transfering this research to industry;
- testing and regulating the industry to ensure cetain standards are met for consumers;

In contrast, the U.S. Department of Energy since 1980 has moved away from funding basic wind energy research.

In addition the wind industry must face the problems that there is a need for the next generation of machines that have the durability of the European machines and the effeciecy of the top of the line American machines. Many of the current "high technologies" in the United States today would be applicable to the development of these machines.

THE NEED

There is a pressing need to match the European efforts with a comparable research, industry support and industry reguation program.

The second step would be start work towards developing the next generation of wind machines with the efficiency of the American machines and durability of the Europeans. This would entail:

- collection of information on the science and engineering of of wind machines;
- materials design and philosophy research;
- systess optimization and testing;

PROPOSED ACTION

The most basic step is to revive wind energy research in this country. In this area the University of Massachusetts has the most distinguished department in the country. The University would recommend funding these research areas in the Solar Energy Research Institute's budget: 1) wind/diesel system analysis; 2) wind driven pumping systems; 3) wind energy from turbulence; 4) wind farm spacing; 5) environmental impact of wind machines; 6) variable speeds of wind turbines; 7) yaw dynamics.

Mr. BEVILL. Thank you.

You know this subcommittee has been very supportive of the wind energy program and we have always appropriated more than the budget called for.

Thank you very much.

Mr. MYERS. Mr. Chairman, Mr. Conte, of course is quite interested in the program. He has talked to us about the program and he regrets he could not be here this afternoon. He is already committed to another meeting.

Mr. MANWELL. Right. I did get a brief chat with him earlier.

Mr. MYERS. Thank you.

Mr. MANWELL. Thank you very much.

THURSDAY, APRIL 10, 1986.

WATER RESOURCES PROGRAM

WITNESS

EDWARD R. OSANN, DIRECTOR, WATER RESOURCES PROGRAM, NATIONAL WILDLIFE FEDERATION

Mr. BEVILL. Mr. Edward Osann. The Chair recognizes you. You may proceed.

Mr. OSANN. Thank you, Mr. Chairman.

I have a statement I will not attempt to read in the interest of time.

Mr. BEVILL. All right. Your full statement will be made a part of the record.

Mr. OSANN. My name is Edward Osann, and for the record, I am Director of the Water Resources Program of the National Wildlife Federation. I would like to say, before beginning, that I am always struck and appreciative, Mr. Chairman, of the courtesy that is extended to the members of the environmental community in general and the National Wildlife Federation in particular, when we come before your subcommittee to testify.

Mr. BEVILL. We are always delighted to hear you because we don't know it all, and we are glad to get your views that you always express and the information that you present to us.

Mr. OSANN. Thank you, Mr. Chairman.

There are a number of issues and projects that are dealt with in our testimony and I would like to use the limited amount of time available just to hit three or four of the programs that I know members of the committee have a particular interest in.

I would like to point out with regard to the Garrision diversion project, the National Wildlife Federation has been involved in negotiations that have led up to this current piece of legislation recently reported by the House Interior Commmittee. We are strongly supportive of that legislation. We urge its enactment and are actively working with our own membership, members of Congress, the press and so on, to spread the word about the aspects and benefits of that legislation.

In the interim, however, because that has not been enacted, we view the prudent course of action for this subcommittee would be to refrain from providing further construction appropriations for

Garrison under the old authorization. Upon enactment of the new legislation, we would support supplemental appropriations, we would support reprogrammings, unobligated funds that the bureau may have on hand, but we don't——

Mr. BEVILL. When is that Interior Committee bill going to be on the floor?

Mr. OSANN. We believe it will be on the floor the third week of this month. We are working with the North Dakota delegation in the Senate to try to procure prompt enactment of it.

With regard to the Bonneville unit of the central Utah project, I am afraid that the repayment programs that were identified by the committee last year, in the Energy and Water Appropriations Bill for 1986, still persist.

You may recall, that time that the committee conditioned the release of FY 86 funding, new construction funding, for this very large project, upon the execution of a supplemental repayment contract that would commit local interests to repay all municipal water supply costs. Unfortunately, we have a report from the General Accounting Office in March of this year, which confirms that the use of the 1958 Water Supply Act to confer portions of municipal water supply costs was illegal. The contract that was negotiated by the bureau and approved by voters in Utah, is based upon this action which GAO found to be illegal.

Now, the bureau knew about this at the time of elections, the district knew about this at the time of elections. They went ahead on the flawed contract and now the district has said we don't want to face the voters with another election but yet they want your committee to face your colleagues on the floor with a bill that contains a major new commitment of funding for this project, with inadequate cost recovery.

I think again it would be appropriate to condition funding for the Bonneville unit on an unequivocal commitment of cost recovery for municipal water supplies.

I would like to also mention briefly the area's Yazoo Backwater Pumpage Plant in Mississippi. We are very strongly opposed to the construction of the project. This is a very sizable facility, a $186 million project. The purpose of it is to trough out seasonable high water from the Yazoo Delta just north of Vicksburg. To put the size of the plant in proportion, the pumping capacity of the plant, which is 17,500 cubic foot per second—CFS—is larger than the average annual discharge off the Delaware River at its mouth. So this is an enormous facility that is proposed to be built there in the delta.

Why are we building this? Well, the project benefits—80 percent of the project's beneficiaries are agricultural intensification and enhancement based upon the additional value of agricultural commodities to be produced either on previously cultivated land or land that would be cleared after construction of this project and converted to cropland. The point here being that this is in direct contrast to the general policy embodied in the farm bill, that we need to take at least some marginal land out of production—up to 40 million acres—and here we have a major investment to stimulate new production.

Our interest, of course, is in the environmental impact of this particular project. This part of the country is very important wintering for our waterfowl, for our birds on the Mississippi flyway and central flyway. This is one of the most important wintering habitat areas for migratory waterfowl in the state. It is significant and I think it is underscored by the fact, that the Mississippi Flyway Council, which is one of four flyway councils and made up of 17 states and Canadian Provinces' wildlife agencies, just recently passed a resolution coming out in opposition to the construction of the pumping plant.

So we are not here just to say no on this particular project. We are inalterably opposed to the construction of the plant, but I am pleased to report that the Federation, in conjunction with our Mississippi affiliate, Mississippi Wildlife Federation, has developed an alternative project, a predominantly nonstructural project, that is far less expensive than the pumping plant, that is environmentally sensitive and provides more benefits to more people, more individual people and residents of the delta, than the project proposed by the Corps.

We will be discussing this with the Mississippi Congressional Delegation, with Mr. Franklin and others. We will keep you posted on this. We look forward to working with the committee and having the cooperation of the committee in getting a compromise proposal on this project funded.

Mr. BEVILL. All right, can you wrap it up?

Mr. OSANN. There has been quite a bit of discussion about Cliff Dam already. I won't repeat it all. This is a picture of the Cliff Dam site. This is the Prairie River, about 40 miles from Phoenix. The surrounding countryside is the Tonto National Forest. Standing here you have the dam site about a mile behind you. Everything in front of you would be inundated by the dam up to a depth of several hundred feet.

While I think you can get a sense of the rugged beauty of this particular part of the desert country, even this photo doesn't do justice to the value of the habitat. The cottonwood and willows along the river really are the key elements in these desert rivers. This is very important habitat.

Mr. MYERS. It had more water in it when I saw it.

Mr. OSANN. It has high flows.

Mr. MYERS. This is a lot more water. It just trickled the time I was there.

Mr. OSANN. These desert rivers are like a linear oasis, and with the development of the state, the mouth of this kind of habitat, this kind of ecosystem, has shrunk dramatically. There is only a small fraction of what was originally available at the time of settlement of undeveloped desert and prairie systems in Arizona. Our feeling is that this is really the last place we want a dam, not the next place, and even then only when it is absolutely necessary. And that there are no reasonable alternatives, we don't believe that to be the case.

[The statement of Edward R. Osann follows:]

NATIONAL WILDLIFE FEDERATION

1412 Sixteenth Street, N.W., Washington, D.C. 20036-2266 (202) 797-6800

STATEMENT OF EDWARD R. OSANN

DIRECTOR, WATER RESOURCES PROGRAM

NATIONAL WILDLIFE FEDERATION

BEFORE THE

SUBCOMMITTEE ON ENERGY & WATER DEVELOPMENT

HOUSE APPROPRIATIONS COMMITTEE

April 10, 1986

My name is Edward R. Osann. I am the Director of the Water Resources Program of the National Wildlife Federation. The Federation, with over 4.5 million members and supporters nationwide, is America's largest conservation organization, now entering our 51st year of conservation advocacy and education. During the past 15 years alone, our membership has adopted more then 60 resolutions establishing Federation policy on various aspects of water resource conservation and development. The Federation and its affiliates have a history of working with state officials and the Federal construction agencies to resolve differences over water projects and policies. We have strongly supported legislative efforts, on both appropriation and authorization bills, to redirect the Federal water resources development program.

GENERAL BUDGETARY ISSUES

Water Resources

We believe that the Administration's request of $3.7 billion in new budget authority for water resources development, an increase of nearly $200 million above that provided for Fiscal 1986, is excessive and inappropriate. We recommend that the Administration request for the Corps of Engineers and the Bureau of Reclamation budgets be reduced by $500 million.

In light of the ongoing Federal budgetary dilemma, every effort should be made to eliminate wasteful and unnecessary spending, while sustaining critically important functions of the Federal government. Regrettably, many projects now under construction by the Bureau of Reclamation and the Corps of Engineers are indeed wasteful and unnecessary, by any objective contemporary view of efficiency and national need. We cannot support increases for such environmentally damaging construction activity at a time when the Fish & Wildlife Service faces a 22.5 percent cut from its Fiscal 1986 level, and the Environmental Protection Agency struggles with wholly inadequate resources to tackle critical issues such as toxic waste disposal.

The Bureau of Reclamation is now accelerating construction on such costly and controversial projects as the Central Arizona Project and the Central Utah Project. We believe that expenditures for these projects and others can be stretched out to reduce outlays in the coming year, and to encourage the reformulation of such projects into less costly and less environmentally damaging configurations. Similarly, the Corps has numerous projects, such as the Red River Waterway and other inland navigation expenditures, which can be stretched out, reduced, or eliminated altogether with little impact on essential transportation services.

Uranium Enrichment

For several years, conservationists have proposed that Federal uranium enrichment activities be operated on a more businesslike basis, to send the appropriate signal to the marketplace about the relative values of conservation and consumption of enriched uranium. At this time, we strongly object to the Administration's plan to write off some $4 billion, more than half of the unrepaid Federal investment in the uranium enrichment program. The effect of this write-down is to condone the underpricing of uranium enrichment services to nuclear utilities, and to perpetuate a significant Federal subsidy of nuclear power consumption. We urge the subcommittee to carefully review the Department of Energy's repayment plan, and to take the steps necessary to ensure that DOE does not take administrative action, such as the new enrichment criteria proposed January 29, which violates the full cost recovery provisions of the Atomic Energy Act.

WATER RESOURCES PROJECTS

Yazoo Backwater Pumping Plant, Yazoo Basin Project, Mississippi

The Federation is strongly opposed to the $186 million Yazoo Backwater Pumping Plant, an enormous facility intended to drain seasonal high water from the bottomlands of the Yazoo

Delta just north of Vicksburg. This pumping plant would have a capacity of 17,500 cubic feet per second. By way of comparison, this is greater than the average annual flow of the Delaware River.

Nearly 80% of the project's benefits are derived from additional production of agricultural commodities on poorly drained cropland, and the induced clearing of additional forested wetlands for conversion to cropland, contrary to the policies embodied in the 1985 Farm Bill.

The remaining wetlands in the Yazoo Backwater Area are one of the most important wintering areas for migratory waterfowl in the state. Indeed, the significance of this habitat to the migratory birds of the Mississippi Flyway was underscored by the adoption of a resolution opposing the Yazoo Backwater Pumping Plant on March 23 by the Mississippi Flyway Council. The Council is one of the four flyway councils established to assist in the administration of our migratory bird programs and treaties, and consists of the wildlife agencies of 17 states and Canadian provinces.

Although we are unalterably opposed to the construction of a pumping plant, we do not object to more carefully targeted flood damage reduction measures, or to further assistance to financially distressed farm operators in the project area. I am pleased to report to the subcommittee that the Federation, in conjunction with our Mississippi affiliate, the Mississippi Wildlife Federation, has developed a predominantly non-structural alternative to the Pumping Plant that is:

- far less expensive;
- environmentally sensitive; and
- provides more benefits to more people in the Delta than the project proposed by the Corps.

We will be discussing our alternative with Representative Franklin and other members of the Mississippi Congressional delegation within the next 10 days. We look forward to working with this subcommittee to secure approval and funding for this compromise proposal, in the interest of avoiding the controversy and uncertainty that would be associated with further attempts to fund the Pumping Plant.

Elk Creek Lake, Oregon

The Administration has requested no new funding for construction of Elk Creek Lake. We strongly support this recommendation. Assessments by both the General Accounting Office and the Corps of Engineers have found this project to be severely lacking in economic feasibility. This fact, together with the environmental threats posed to the Federally-protected

Rogue River downstream and with current Federal budgetary difficulties, make a compelling case against any further expenditure of Federal funds for this unsound project.

Cliff Dam, Central Arizona Project

Cliff Dam is a $385 million project proposed by the Interior Department's Bureau of Reclamation. It is to be built on the Verde River at a site within the Tonto National Forest, about 40 miles northeast of Phoenix.

If built, Cliff Dam will inundate up to 8,700 acres of the national forest, destroying six miles of the Verde River and its desert streamside habitat on which bald eagles and other wildlife depend.

The increased real estate value of undeveloped river bottom land in Phoenix and its suburbs, which is downstream from the proposed dam, accounts for nearly half of the economic benefits claimed for Cliff Dam by the Bureau.

Cliff is an unnecessary add-on to a larger package of development projects -- known as "Plan 6" -- which would complete the $4 billion Central Arizona Project. Water storage, flood control, and improvement in the safety of existing dams -- all benefits claimed by the Bureau -- can be achieved without constructing Cliff and at less overall cost to the Treasury. (see attachments.)

The Bureau of Reclamation has requested $326,000 for FY 87 for preconstruction studies for Cliff Dam. We believe that enough is known about the relative merits and demerits of this project for the Congress to make a decision at this time not to commit Federal funds to this dam. A decision now to strike funding for Cliff will allow local project sponsors to make plans -- both physical and financial -- under conditions of greater certainty than would prevail if studies for this controversial project are continued into the future. We urge the subcommittee to reject any request for funding for Cliff Dam.

Bonneville Unit, Central Utah Project

Last year, the Congress conditioned the availability of funding for new land acquisition and new construction of the Bonneville Unit upon the execution of a supplemental repayment contract with the local project sponsor to ensure repayment of all project costs allocated to municipal and industrial water supply. An election was held in Utah on November 19 resulting in local approval of a supplemental repayment contract. Regrettably, the contract negotiated by the Bureau of Reclamation's regional office and approved by the voters was deficient. This finding was made by the General Accounting

Office prior to the election, and was made known to both the Bureau and the local sponsor well before the election. According to GAO, up to $97 million in interest charges that are properly the responsibility of local interests are not secured by the supplemental contract. Accordingly, we believe that it is once again appropriate for this committee to insist upon full and timely repayment, secured by contract. We urge that the Bureau's FY 87 request of $83.8 million for the Bonneville Unit be withheld in the absence of unequivocal assurances that non-Federal interests will repay all reimbursable costs allocated to municipal and industrial water supply.

Dolores, Colorado

We call the committee's attention to a continuing problem with the allocation of costs of the Dolores project that will, if unabated, serve to underprice such reimbursable project outputs as commercial power and municipal and industrial water.

Public Law 98-569, the Colorado River Basin Salinity Control Act Amendments, authorized salinity control as a purpose for the Dolores project, and combined features of the McElmo Creek Unit of the Colorado River Water Quality Improvement Program with the Dolores Project, with the following proviso:

> And provided further, that such allocation of costs to salinity control will include only the separable and specific costs of these specific facilities and will not include any joint costs of any other facilities of the Dolores participating project.

Notwithstanding this clear statutory direction, the Bureau noted the following in its FY 86 request for Dolores:

> The allocation of costs to the salinity control function includes $7,961,000 in additional reallocated costs which are not associated with the provision of specific project features associated with the McElmo Creek Unit and are the net result of the reallocation of a portion of project costs to the provision of a new function.

In response to this disregard for the law, the Committee Report on the FY 86 Energy and Water Development Appropriation Bill (H. Rept. 99-195) contained the following statement:

> The committee shares the interest of the Administration in the full and timely recovery of reimbursable costs incurred by the Federal government in the Reclamation program. This heightened interest in cost recovery makes it all the more necessary that established procedures for cost allocation - whether

set by formal administrative action or by statute - be scrupulously followed. The Committee is not convinced that the latest allocation of costs for certain projects as presented by the Bureau of Reclamation to the Committee, represent an accurate interpretation of statutory requirements and legislative intent. The Committee's approval of annual appropriations requests for these projects is not to be construed as a Congressional sanction for any such departure from previous statutory guidance on cost allocation.

Unfortunately, the Bureau's justification material for its FY 87 request for Dolores contains a cost allocation that once again fails to comform with the requirements of PL 98-569 or the policy of the House Appropriations Committee. Under these circumstances, we believe that the Bureau's FY 87 request of $20.4 million for Dolores should be contingent upon the development and transmittal to the Congress of a satisfactory allocation of costs to all project purposes.

Garrison Diversion Unit, North Dakota

The Federation has been actively involved in negotiations leading up to the March 19 approval by the House Interior Committee of H.R. 1116, the bill to reformulate the Garrison Diversion Unit. We strongly support the enactment of this legislation, and have agreed to support the appropriations necessary for implementing all purposes of the project, as reformulated.

Enactment of H.R. 1116 is, however, by no means assured. We continue to believe that the current authorization for the construction of the Garrison Diversion, PL 89-108 (1965) provides no tenable basis for the further expenditure of Federal funds. Pending enactment of H.R. 1116, we urge the committee to refrain from including any new funding for construction of the Garrison Diversion in the FY87 Energy & Water Appropriations Bill. Upon enactment of H.R. 1116, we would support supplemental appropriations or reprogramming of previously appropriated funds to promptly initiate work on the modified project.

Prairie Bend Unit, Nebraska

We urge the committee to carefully review the progress, or lack thereof, of the Prairie Bend study now underway in the Platte River Basin of Nebraska. The outstanding natural values of the Platte, such as its use by nationally significant concentrations of migratory birds, including the endangered whooping crane, call for the development of a technical database of the highest caliber. We urge the committee to discourage the Bureau from committing study funds to the engineering of specific project features until the essential

hydrological and biological data have been assembled and modeled to the satisfaction of all interested study participants.

Columbia Dam, Tennessee

The Tennessee Valley Authority recently issued a revised benefit-cost analysis on the Columbia Dam that estimates only 40 cents in benefits would be returned for every dollar of the $159 million required to complete the dam. As planned in 1968, the Duck River project was to include Normandy and Columbia Dams to provide flood damage reduction, municipal and industrial water use, recreational opportunities, and improved water quality. Normandy Dam, which was completed upstream from the Columbia site in 1972, provides a major portion of the benefits that a two-dam system would obtain. Therefore, the incremental benefits of adding Columbia would be small relative to the large costs of completing the project.

The potential flood damage at the city of Columbia is being reduced by the gradual removal of structures in the flood plain. This approach is much less expensive and more desirable than permanently flooding ten times as much land as would be protected by a dam. We urge the committee to resist any efforts to make FY 87 appropriations available for this obsolete project.

New Starts for FY 87

The selection and timing of new starts -- the initial year of appropriations to construct a water project -- has been one of the most contentious and controversial issues faced by this subcommittee for the last decade. This year, the prospect of enactment of H.R. 6, the Omnibus Water Resources Development Bill, suggests that the range of choice before the subcommittee may be considerably broadened. We have three recommendations to offer. First, we urge you to refrain from appropriating second-year funds to those FY 86 new starts where local interests are unable or unwilling to enter into cost-sharing agreements satisfactory to the Administration. These include Animas-LaPlata and Parker Lake. Second, we recommend that any FY 87 new starts be contingent upon both the enactment of any necessary authorization, and upon cost-sharing under terms contained in the Omnibus Bill or satisfactory to the Administration. Third, we recommend that consideration be given to the initiation of funding for mitigation of damages to fish and wildlife habitat from completed projects, such as the Tennessee Tombigbee Waterway Mitigation Plan.

Power Marketing Administrations

The Administration's proposal to de-Federalize the Federal power marketing administrations (PMA's) over the next 4 years warrants careful review. Based on data currently available, we

do not believe that a transfer of ownership of the Bonneville Power Administration from the Federal government to non-Federal interests will necessarily advance the public interest. Conversely, however, we believe the current operating record of the other four PMA's fails to demonstrate that their retention in Federal ownership serves the public interest.

Given the current state of budgetary limitations, environmental considerations, and evolving conditions in the electric power industry, the Administration's proposal, and all reasonable alternatives, deserve a thcughtful and rigorous evaluation. We are urging the Department of Energy to undertake a full evaluation of the de-Federalization proposals, and reasonable alternatives, pursuant to the National Environmental Policy Act. NEPA provides a useful framework for developing and evaluating policy options before a final decision is reached. We have suggested that de-Federalization proposals for each PMA be the subject of a separate environmental impact statement.

Because we believe that the NEPA process should be brought to bear on this issue, we urge the committee to reconsider its prohibition against the study of market-based pricing of Federally generated hydropower with funds appropriated to the Department of Energy. Market-based pricing can and should be evaluated as one of several alternatives to the Administration's de-Federalization proposal. The reenactment of the prohibitory language contained in previous Energy and Water Development Appropriation Acts would constrain unduly the NEPA process and deny Congress and the public a portion of the data needed to make an objective appraisal of the Administration's proposals for the PMA's.

Thank you for the opportunity to present these views.

Arizona Republic

Mesa buying farmland for water rights

6-4-85

Creation of wasteland feared by Pinal County

By BARBARA ROSE
Southeast Valley Bureau

MESA — The City Council on Monday authorized buying an additional 1,930 acres of farmland for water rights, pushing Mesa's future land holdings in rural Pinal County to about 18 square miles.

The land deals are the most recent in a buying spree by Mesa that Pinal County officials fear will result in a "wasteland" between Coolidge and Eloy, where the farmland is located, unless Arizona's ground-water code is changed.

Mesa plans to leave the farmland idle so ground water eventually can be pumped from there for Mesa's growing population.

Coolidge City Manager Gene Wieneke has said his city's attorneys have found no way to stop Mesa from withdrawing the water.

"They (Mesa officials) have done their homework under the existing ground-water law," Wieneke said. "Our big concern is the creation of a desert."

He said Coolidge and other cities will ask the state Legislature next session to amend Arizona's ground-water code to allow Mesa to use a portion of the water on the farmland. Currently, the code prohibits irrigating farmland after the agricultural water rights have been transferred for municipal use.

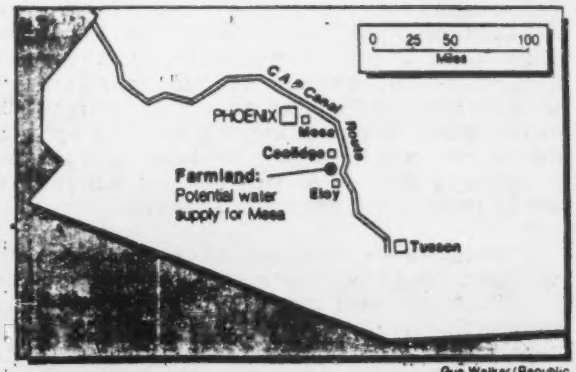
Mesa officials said they will help in trying to change the law.

"It's in the best interest of Coolidge and Eloy and Mesa to amend the law together so we can use the land," said Karl Kohlhoff, Mesa's water-resources coordinator. "It's not going to be a wasteland."

Kohlhoff said the land could be used for proving grounds, a commercial campground or farmland for crops that use little water, such as desert pines, which are grown and sold as Christmas trees.

Mesa has not developed a plan

— Water, B5



Gus Walker/Republic

Water 6-4-85

Continued from B1

for managing the land, which is more than 40 miles southeast of the city. City officials say Mesa probably will not need the ground water for 15 years.

Long-range plans call for construction of pipelines to pump the water to the nearby Central Arizona Project canal, where it would be shipped to Tucson to exchange for other water removed from the CAP canal near Mesa.

For years, Tucson has been buying Avra Valley farmland north of the city for water rights. Last year, Scottsdale purchased Planet Ranch, on the Bill Williams River, for its river-water rights.

Mesa's purchases, which have not been completed, will total about $29 million. Last month, the council authorized paying $23.4 million to 11 Pinal County landowners for about 9,500 acres. The purchases authorized Monday total $5.68 million in cash to two landowners for 1,930 acres.

Negotiations for 298 more acres fell through Monday, and no futher purchases are expected.

Mesa's Pinal County lands are expected to yield about 31,000 acre-feet of water a year, or slightly more than 10 billion gallons. An acre-foot is 325,851 gallons, or enough for an average urban family of five for a year.

Mesa officials were in the market for at least 30,000 acre-feet annually to develop the eastern portion of the city.

2 Scottsdale (Ariz.) Daily Progress Thursday, August 22, 1985

Phoenix starts statewide search for 'water farms'

The city of Phoenix has launched a statewide search that could lead to buying "water farms" similar to the city of Scottsdale's Planet Ranch.

"We're looking pretty much everywhere for water rights purchases," said Bill Chase, the city's water adviser.

The purchases could begin as soon as next year, Chase said.

"Water farms" are agricultural land bought by municipalities to obtain water rights — such as Planet Ranch in northwestern Arizona, for which Scottsdale paid $11.6 million last year.

Other Valley cities have bought or are negotiating to buy water farms.

Under Arizona's "first in use, first in ownership" laws, water rights belong to the property owners who first used the water on their land. Rights can be sold to subsequent owners.

Phoenix, which has availability of 280,000 acre-feet of water a year, estimates that it needs rights to 900,000 acre-feet annually to meet its 30-year needs and must obtain about 80,000 acre-feet by buying water rights, Chase said.

An acre-foot — 325,850 gallons — is the amount of water sufficient to cover an acre to a depth of one foot. It is the average amount of water used in a year by an urban family of four.

Chase said the city aims to buy the water rights in five years "and probably much sooner . . . we're not in a panic . . . but we don't want to wait to the last minute."

About half of Phoenix' projected new water needs, 125,000 acre-feet, are to be met by the $4.6 billion Central Arizona Project, he said.

That is enough to supply the city through the turn of the century, he said.

Phoenix' share of water storage that would come from construction of the proposed $836 million Cliff Dam on the Verde River and the $319 million addition to Roosevelt Dam on the Salt River should add 20,000 to 30,000 acre-feet a year, he said.

The city also estimates it can garner 40,000 to 60,000 acre-feet a year from wastewater reclamation, he said.

Chase said the city has hired a consultant, Larry Davis, to look for potential purchases and to screen sale offers.

The city has been approached by a number of people about possible water rights sales, Chase said.

"Some proposals will take detailed studies because we are lacking data on them now. It's better to invest some time and money for study before using public money for major purchases," he said.

The studies and purchases will be financed through revenues from city water sales — water bills — to residential and commercial customers, he said.

Those payments could affect about 14,000 Scottsdale homes and businesses south of Chaparral Road who are served by the Phoenix city water system.

Scottsdale is negotiating to buy that portion of the system.

Planet Ranch, an alfalfa farm on the Bill Williams River near Lake Havasu City, became one of the state's first water farms in the spring of 1984 when Scottsdale bought it to acquire rights to 13,000 acre-feet of water a year.

Scottsdale does not expect the water will be needed for another 10 to 20 years, but the city must continue the farming operation to retain water rights.

—KEITH BAGWELL

Scottsdale (Arizona) Daily Progress

11-21-85

Supporter says CAP can move city water

By MARK FLATTEN
Progress Staff Writer

There should be enough room in the Central Arizona Project canal to transport water from the city's Planet Ranch in western Arizona to Scottsdale, the head of a private CAP support group said today.

Bill Wheeler, executive director of the Central Arizona Project Association, said the capacity of the aqueduct is so large that water from Planet Ranch can easily be carried.

The city owns rights to 13,500 acre feet of water a year from the Bill Williams River that crosses the ranch.

The CAP canal can carry more than 2 million acre feet of water a year, Wheeler said.

"They (Scottsdale officials) are working with the Central Arizona Water Conservation District to make arrangements so they can use the aqueduct," Wheeler said at a Mayor and City Council breakfast at the Scottsdale Center for the Arts.

"They are going to have to work out the managements, but there are times the water can be moved. An important element of the CAP canal is it is a big, flexible system and we can work out all kinds of arrangements."

Federal and state officials, including Tom Clark, head of the CAWCD, said earlier that there is no assurance the CAP will have room for Planet Ranch water.

Scottsdale bought the 2,200-acre alfalfa farm for $11.6 million last year to obtain its water rights.

City officials hope to use the CAP aqueduct to transport the water 180 miles to the city, but don't believe the water will be needed for at least 10 years.

Wheeler's organization was set up in 1948 to support efforts to raise money for canal construction. It is not a government agency.

Clark and officials of the U.S. Bureau of Reclamation and the Arizona Department of Water Resources told the *Scottsdale Daily Progress* in May that the canal may run too full to carry the city's water.

But Wheeler said he is optimistic because the capacity of the CAP canal is so large.

"You're just talking of a very minute amount of (Planet Ranch) water in the CAP," Wheeler said. "I think they can squeeze it in. But the only guarantee we have is that the (CAWCD) board has said Scottsdale can use it if they can squeeze it in."

In a related matter, state and federal water officials will meet Dec. 2 to discuss an agreement to provide $327 million in local funds to speed construction of the canal, Clark said Wednesday.

Clark said officials made progress on the plan during meetings Monday and Tuesday, but will not have an agreement before Thanksgiving as they hoped.

A new proposal is to be circulated on Friday or Monday by the U.S. Bureau of Reclamation, which is building the $3.5 billion project, he said.

State and local officials have offered to pay the $327 million up-front if the federal government will complete the CAP, including a water storage and flood control feature known as Plan 6, by 1988.

The CAP is intended to carry Colorado River water to central and southern Arizona.

Friday, November 9, 1984

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Where The Spirit Of The Lord Is, There Is Liberty—II Corinthians 3:17

EDITORIALS

IN PHOENIX

No Water Crisis Ahead

THE city of Phoenix does not face a water crisis or unavoidable water shortages — not now or in the foreseeable future.

In fact, contrary to some reports, there is every indication the city will have a water surplus beyond the next decade.

Even then, shortages are unlikely because of various supply options and conservation measures.

That is not to say Phoenix should avoid mandatory water conservation, higher rates or penalties for waste.

But the costs of such programs must be weighed against potential savings. Legal issues also are involved.

Phoenix's large per-capita water use has left it with a poor public image.

Viewed from elsewhere in the nation, Phoenix is seen as a water wastrel, while American taxpayers underwrite many Central Arizona Project costs.

Phoenix now uses so-called On-Project or Salt River Project water. SRP will reduce ground-water pumping under state law, but its surface water will meet average needs.

When surface supplies are low, ground water can be used. If they are high, such supplies can replace used ground water.

The city also uses so-called Off-Project water. This is ground water, serving two-thirds of 900,000 customers. It uses so-called gate water as well, which is obtained from the Verde River, reaching one-third of the total.

Phoenix now services its customers with less than 100,000 acre-feet of water per year.

Some 114,000 acre-feet of CAP water will flow to Phoenix starting in mid-1985. Another 10,000 acre-feet of dependable gate water will be available. That total of 124,000 acre-feet should meet city demands until 2000.

That is not a crisis.

If needed, supplies can be increased in various ways.

One large source would be the use of effluent or treated waste water instead of drinkable water on golf courses and other areas.

The city also may buy some of 1 million acre-feet of Colorado River water from farmers and other owners in western Arizona.

This would require statewide cooperation and inspired leadership to avoid a repetition of the water war being waged in California.

A costly pipeline and pumping system would have to be installed, but the water is available.

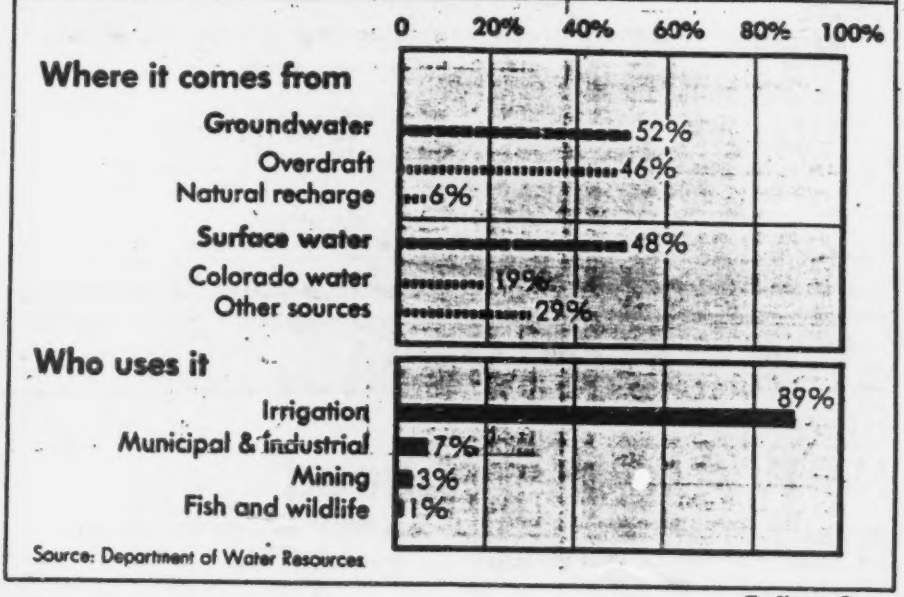
The city could pump unused ground water from various parts of the state. That would require buying water rights as well as costly pipelines and pumping. It would again necessitate statewide leadership to reach agreement.

Many water-conservation practices can be instituted — through pricing, waste penalties, reuse, water-saving devices, desert landscaping and locating high-volume water users in the SRP system.

All the solutions are available in Arizona. It is a question of study, finance and prudent planning.

The Phoenix Gazette Fri., Oct. 11, 1985

Arizona's water



Source: Department of Water Resources

The Phoenix Gazette

ARIZONA The Phoenix Gazette Fri., Oct. 11, 1985

Sometimes less can mean more

John Dougherty
Agriculture

The exaggerated claim that the Valley faces a water shortage is nothing more than a well orchestrated hoax.

And what a costly joke it is. The punch line is that the Valley is saturated with water.

The problem lies not in the supply of water but how it is used.

If you doubt that we are awash in water, ask yourself the next time you drive past a new housing subdivision advertising lake front condos, "Where are they getting all the water?"

New housing projects come from old farm land. And old farmers have a ton of water. And they are getting rich from it.

So while local governments urge residential water consumers to put a brick in the toilet and quit watering their lawns, they approve the construction of subdivisions with waterfront property and private docks.

As the population expands, farmers who have benefited from years of subsidized electricity and water, benefit again. This time, the payoff is not measured in pennies per kilowatt-hour but in millions of dollars for the land they sell and the water it controls.

As the real estate scramble unfolds in the Valley it becomes increasingly apparent that Arizona's water is managed to benefit a tiny number of heavily subsidized farmers at the expense of every American taxpayer.

Arizona agriculture, with its paltry 2 percent contribution to the gross state product, is by far the state's largest consumer of water.

According to still accurate 1977 Department of Water Resources figures, irrigated agriculture consumes about 4.3 million acre-feet of water or an astounding 89 percent of the water used in the state.

On the supply side, surface waters account for 2.3 million acre-feet while ground water supplies 2.5 million, of which 2.2 million is not returned to the water table.

By reducing the amount of water consumed by agriculture most, if not all, of the ground water depletion could be eliminated while the population continues to expand.

The biggest single water consumer in the state is cotton, which requires an average of 4 acre-feet of water a year. The average rainfall in the Sonoran Desert, where most of the state's cotton is grown, is about 10 inches.

In 1984 the state's 1,943 cotton farms produced $310 million worth of Upland cotton on 430,000 acres — most of which was exported to Asian textile mills.

The Pinal Active Management Area, which has completed the most extensive survey of water use by all

See ● Water, D-5

● Water

From D-1

consumers, estimates that 60 percent of the water consumed by agriculture in Pinal County goes to grow cotton.

Cotton farms gulped 775,000 acre-feet of water in the Pinal Active Management Area in 1984. Much was drawn from the ground using pumps powered by cheap subsidized electricity from the Hoover Dam.

The amount of water used in the Pinal AMA just to grow one crop of cotton is more than twice the amount of water consumed by all Arizona residential and industrial users.

To justify such a huge use of water in Pinal County for a commodity worth about $80 million in 1984, one would think there must be a good reason, like a severe cotton shortage.

But the world and the United States are in the midst of a cotton glut.

As the inventories rise, the price for cotton falls. The collapse in cotton prices, however, doesn't hit home because the federal government will pay the farmer the difference between the market price of about 60 cents a pound and a target price of 81 cents.

So, despite economic signals that there is overproduction in cotton, Arizona farmers keep on planting because they know Uncle Sam will take care of them to the tune of $41 million as in 1984.

At the same time, this elite group, which includes Deputy Secretary of Agriculture John Norton, is squandering vast amounts of Arizona's most vital resource — water.

The next time you hear of the urgent need to build another water storage dam such as the proposed $385 million Cliff Dam on the Verde River, ask yourself if it wouldn't be more sensible to just grow less cotton.

Mr. BEVILL. Thank you very much.
Mr. RUDD. Mr. Chairman.
Mr. BEVILL. Yes.
Mr. RUDD. You know—do you live in Arizona?
Mr. OSANN. No, I don't.
Mr. RUDD. Have you looked at the dam site?
Mr. OSANN. Yes, I have.
Mr. RUDD. How much time did you spend there?
Mr. OSANN. A day.
Mr. RUDD. A day?
Mr. OSANN. Yes.
Mr. RUDD. That would make you an expert.

Are you aware six million acre feet of water in the last six years flowed down the river and was lost forever that could have been held and could have served the community very well, agriculture users, municipal and industrial users and Indian tribes, to replenish underground—

Mr. OSANN. Is that the Verde River?

Mr. RUDD. That is right. And the Salt, together. They flow sometimes equally.

But let me just say we don't make a determination where you put a dam, the good Lord did that by establishing a topography and geography of the terrain, and it takes several years sometimes to fill a dam. The reason we fill it is to provide water for human beings.

When you mentioned this site, I think you are talking about two eagles nests that moved up the river from the Orme Dam site which are living in that area. But the eagles are hardy birds, and I am sure that they can take care of themselves. The only reason anyone is considering this dam site is for the benefit of humankind.

I thank you for your statement, and I thank you for your directness and the amount of time you spent there. You say it is not justified, but in your statement it doesn't show why.

Mr. OSANN. We would be glad to elaborate on that further.

Mr. RUDD. Submit it for the record.

Mr. BEVILL. Get that in, if you would. We will be closing the record up.

[The information follows:]

NATIONAL WILDLIFE FEDERATION
1412 Sixteenth Street, N.W., Washington, D.C. 20036-2266 (202) 797-6800

April 17, 1986

The Honorable Tom Bevill
Chairman
Subcommittee on Energy &
Water Development
Committee on Appropriations
U.S. House of Representatives
Washington, DC 20515

Dear Mr. Chairman:

At the conclusion of my testimony on Energy and Water Development Appropriations for Fiscal Year 1987, Mr. Rudd requested further information on the contention that Cliff Dam is not justified. We believe that Cliff Dam is wasteful and unnecessary for the following reasons:

1. Water supply benefits alone do not justify construction of Cliff. Cliff accounts for only 2 percent of projected average annual water yield of the Central Arizona Project (Final Environmental Impact Statement (FEIS), Regulatory Storage Division, pp. 39, 44). Water supply comprises only 10 percent of projected economic benefits of Cliff (FEIS, p. 235).

2. Dam safety alternatives for the Verde River are available that are less costly than constructing Cliff. Plan 9, which includes modification of existing dams, is $46.6 million less than Plan 6, which includes Cliff Dam. (FEIS Summary, p. 30 and FEIS, pp. 39-49). The Bureau of Reclamation identified extensive Verde River dam safety modifications that can be made for $279 million (FY83 dollars), substantially less than the current cost of building Cliff. (Modification Report, Salt River Project, Arizona, Safety of Dams Program, April 1984, p. 37). A 1981 study by Camp, Dresser and McGee for the Army Corps of Engineers suggested that safety improvements could be accomplished on the Verde River dams for $65 million (Modifications to Horseshoe and Bartlett Dams, Stage II Structural Design and Cost Memorandum, described in The Arizona Republic, 12-22-82). A variety of dam safety measures are possible within that price range.

3. Almost 70 percent of "Flood Control" benefits are due to location and intensification, rather than prevention of damages to existing homes and businesses. (FEIS, p. 235) The FEIS defines location and intensification benefits as increased land value, usually "a windfall benefit for affected land owners". (FEIS, p. H-9)

4. Environmental values of the damsite are magnified by widespread loss of riparian habitat in desert areas. It is estimated that up to 95 percent of Arizona's riparian habitat at low elevations has been lost and up to 99 percent degraded. (R. Roy Johnson, Senior Research Scientist, National Park Service, personal communication) Ohmart's study of the lower Colorado River indicates a historical decline from more than 5,000 acres of cottonwood communities to 2,800 acres of cottonwood-willow communities and to less than 500 acres of pure cottonwood. (A Riparian Case History: The Colorado River, presented at the 1977 symposium on the Importance, Preservation and Management of Riparian Habitat in Tucson, Arizona). A survey of the lower Gila River by Haase found that only 5% of the 186^ estimated riparian base remained as native riparian communities in 1970 (referenced in Riparian Ecosystems: Their Ecology and Status, U.S. Fish and Wildlife Service, 1981, p. 11).

In our view, the limited scope of certain economic benefits and the questionable nature of the Federal responsibility for promoting other benefits, such as real estate enhancement, combined with substantial and severe environmental costs, strongly support the conclusion that the appropriation of Federal funds for Cliff Dam would not be in the public interest.

Please include this response in the Subcommittee's hearing record at the appropriate point.

Sincerely,

E. R. Osann

Edward R. Osann
Director
NWF Water Resources Program

P. O. BOX 1914 • PHONE 355-6822
JACKSON, MISSISSIPPI 39205

TESTIMONY OF THE MISSISSIPPI WILDLIFE FEDERATION
SUBMITTED TO
THE ENERGY AND WATER DEVELOPMENT SUBCOMMITTEE ON APPROPRIATIONS
SAM KING, PRESIDENT
APRIL 16, 1986

The Mississippi Wildlife Federation is unalterably opposed to the Yazoo Backwater Pumping Project as presently authorized and proposed. Our historical opposition to the project is evidenced by the attached statement delivered in 1982 at a public hearing held at Rolling Fork, Mississippi. Our concerns in this matter have increased as the economy and the conditions in the affected area have changed.

The loss of wetlands and bottomland hardwoods has become a national concern, and Congress has reaffirmed its commitment to environmental quality often in recent years. To proceed with this project would be to deny the validity of that commitment. The installation and operation of the project would cause irretrievable losses of important wildlife and fishery habitat and significantly reduce critical over-wintering migratory waterfowl habitat.

The largest percentage of the claimed benefits from increased flood protection is derived from intensification and expansion of agriculture into the lower-lying areas of the basin. The Farm Bill, existing Executive Orders, and current legislative mandates call for the protection of wetlands and bottomland hardwood forests and a halt to agricultural expansion on fragile lands such as wetlands and a further retirement from agriculture on marginal croplands. Basing almost 80 percent of the benefits from a project on intensification and expansion of agriculture on poorly drained cropland at a time when overproduction is a main cause of the poor health of the farm economy is illogical.

The Federation is sympathetic to the human suffering caused by the frequent flooding of the lower delta, much of which is caused by previous Federal flood control projects. The Mississippi Wildlife Federation, in conjunction with the National Wildlife Federation, has developed and is refining alternative plans to relieve that personal suffering, while at the same time protecting the invaluable natural resources of the area at a significantly reduced cost to taxpayers.

Protecting Our Environment

59-750 O—86——36

We recognize the serious economic conditions our country faces. We also see the need to protect our environment and to forego the wasteful spending of taxpayers' money. Federal efforts should now concentrate on mitigation for past losses and protection of existing structures.

The Federation will be discussing our compromise proposal with our Congressional delegation in the near future. We hope that they, this subcommittee, and all interested parties can work together to secure approval for this proposal in the best interest of our national and state economies and our invaluable natural resources.

4/6/82

P. O. BOX 1814 • PHONE 353-6922
JACKSON, MISSISSIPPI 39205

COMMENTS OF THE MISSISSIPPI WILDLIFE FEDERATION
ON THE YAZOO AREA BACKWATER LEVEE PROJECT
AND THE YAZOO AREA PUMP STUDY

The Mississippi Wildlife Federation opposes the installation of the proposed Yazoo Area Pump Project. We specifically disagree with the projected benefits, costs, apalling energy costs, interest rate applied to borrowed money, mitigation plans proposed, and assessment of future environmental effects, both with and without the project.

Although we are concerned with flooding of cropland and hardships caused thereby, we are obligated by our very presence to be concerned about the continuing loss of environmental quality, wildlife habitat, and water quality caused by the Corps projects. In many cases the projects seem to only provide channels, levees, and subsequent habitat losses, and never fully implement the environmental protection aspects of the projects.

We are convinced that the Corps has not complied with laws, executive orders, rules and regulations, and other policy guidelines that should have been followed in plan formulation. Actually, there is considerable divergence from these, so that only those which benefit the plans of the Corps of Engineers seem to have been fully accepted.

Some of our specific concerns are these:

1. The lack of commitment by the Corps to fulfill long-overdue mitigation requirements caused by previous parcels of the Yazoo Basin Plan. We do not have any real faith in the Corps to properly plan or install the mitigation features proposed in the plan.

2. This project will result in continued serious losses to fish and wildlife habitat, including direct losses, induced clearing, loss of wetlands, and reduced waterfowl areas as wetlands are drained.

3. The economics of the project plan are slanted to inflate benefits and reduce costs. Assumed cotton and soybean yields are high and projected yields are also high. For instance, cotton yields are suggested to be 4.85 bales per acre and soybean yields are suggested to be 97 bushels per acre by year 2039. On the other hand, the interest rate used under economic criteria for plan formulation is only 2½%--many of us would like to borrow money at that rate.

4. There are 3.9 million dollars in annual damages at present. With the pumps in place it will cost 3.099 million dollars annually just for electricity. This is an awesome use of energy during a time when all Americans are tightening their "energy belts". The gains hardly offset the energy costs.

5. The obvious deterioration in water quality downstream was not really addressed. This is required of point sources of pollution in the 1977 Clean Water Act, and it will be necessary for the Corps of Engineers to obtain National Pollutant Discharge Elimination System permits for future discharges into the waters of the United States, pursuant to Section 402 of the Clean Water Act.

6. This project is part of a massive flood control effort in the Yazoo Basin which has been installed project by project. The Corps has been responsible to mitigate wildlife and fishery losses in each project, as much of these losses are directly attributable to Corps actions. Nevertheless, these enormous past losses have not been mitigated and the Corps chooses not to mitigate these, as required, in direct violation of the 1958 Fish and Wildlife Coordination Act.

7. We cannot agree that this project complies with the purpose and intent of Executive Orders 11990 and 11998 protecting wetlands and floodplains from further losses, degradation and encroachment. Actually, the large majority of benefits from this project are brought about by intensification of the floodplain, not by reduction of flooding on lands currently in production of agricultural crops.

8. The so-called Enrironmental Quality Plan and the required nonstructural or mitigation plan do not satisfy the requirements of NEPA, as all alternatives proposed contain pumps or a pump. This is in violation of NEPA, the 1974 Water Resources Development Act, CEQ, and Executive Orders 11998 and 11990.

The Mississippi Wildlife Federation regrets that we continually have to chide any agency as large, well-staffed, and competent as the Corps of Engineers to properly fulfill their appropriate role in formulating comprehensive, logical, cost effective, environmentally sensitive plans to address area problems. We simply do not believe that this approach has been taken in formulating this plan.

Respectfully submitted,

Terry Beckman, President
Mississippi Wildlife Federation

NATIONAL COALITION TO *STOP* CLIFF DAM

The Honorable Tom Bevill
Chairman
Subcommittee on Energy &
Water Development
Committee on Appropriations
U.S. House of Representatives
Washington, D.C. 20515

April 15, 1986

Dear Mr. Chairman:

Please accept this letter for the record of the Subcommittee's hearings on Energy and Water Development Appropriations for Fiscal Year 1987. The National Coalition to Stop Cliff Dam opposes funding for Cliff Dam, to be constructed on the Verde River in Arizona. Although only $326,000 is requested by the Bureau of Reclamation for preconstruction studies in FY87, this is just the first of many payments for a $385 million dam that is unnecessary, environmentally destructive, and financed by questionable funding arrangements.

Cliff Dam is but one of several projects recently proposed for the Regulatory Storage Division, part of the massive Central Arizona Project (C.A.P.). The dam is not essential for water delivery, water storage, hydropower, dam safety, or flood control. The C.A.P., authorized in 1968 to transport Colorado River water into Arizona, is almost halfway complete and already delivers water to Arizona. Cliff Dam will provide no storage for transported Colorado River water, no hydropower, and only 10 percent of the Regulatory Storage Division water yield. Dam safety purposes of Cliff can be achieved at less expense by repairing two existing dams. The major benefit ascribed to Cliff Dam is flood volume reduction, but 70 percent of the flood reduction benefits come from increased floodplain land value rather than protection of existing homes and businesses. Land that does not require extensive upstream flood control is available in the Phoenix metropolitan area for new real estate development .

The environmental consequences of the dam are of national concern. Cliff Dam would inundate 6 miles of desert streamside habitat, the richest and most diverse type of biological community in arid areas. It would

inundate or alter nesting and foraging territories of successfully breeding endangered bald eagles. The known adult population of southwestern bald eagles in North America is concentrated along the rivers affected by the Regulatory Storage Division. Loss of natural stream corridors in the desert reduces the abundance and variety of other valuable wildlife such as black hawks, ospreys, egrets, elk, turkey, beaver and muskrats. A small percentage of Arizona's original riparian habitat remains after continued diversions, damming, and conflicting land uses. Sacrificing additional habitat for a marginal project would be a tremendous waste. Further encroachments should not be the price of restoring what has been lost.

Cliff Dam is expensive as well as destructive. Its costs comprise about one-tenth of the $4 billion C.A.P. price tag. Because the dam would push C.A.P. costs beyond authorized spending limits, its funding has been pieced together to avoid reauthorizing the entire C.A.P. Money authorized for repair of existing unsafe dams, not new dams, would cover over 25 percent of Cliff Dam costs. This is contrary to assurances in Congress that, "(f)unds authorized under this (1984 Safety of Dams) legislation would be used only for the repair of existing dams designed, built and owned by the U.S. Bureau of Reclamation." (Senator Goldwater, August 9, 1984)

A complex up-front financing agreement, negotiated by local interests with the Department of the Interior, would commit the federal government to a fast-track construction schedule for the Regulatory Storage Division, including Cliff Dam. Should Congress fail to appropriate enough money to meet the schedule, the agreement requires the government to forego some local repayment of established non-federal obligations. Moreover, the agreement exempts all local contributions from the C.A.P. cost ceiling, including contributions derived from the re-sale of federally subsidized power.

In conclusion, the superfluous or marginal benefits claimed for Cliff Dam would be gained at great expense to the economy and the environment. The Coalition is mindful that conflict will persist between natural values and water development in arid areas. However, little desert streamside habitat remains today to be conserved or restored because of the claims exercised for years by water development interests. We strongly oppose trading away another river segment for an unnecessary add-on to a massive project. Cliff Dam is an unwise investment fueled by strong local interests and justified by juggling cost allocations, funding, and repayment arrangements. It is not built on a foundation of desirable economic or environmental consequences. We urge the Subcommittee not

to initiate funding for an undertaking that costs so much and offers so little.

Sincerely,

E. R. Osann

Edward R. Osann
Director
Water Resources Program
National Wildlife Federation

for

Peter Carlson
Environmental Policy Institute

David R. Conrad
Friends of the Earth

Charlene Dougherty
National Audubon Society

Laura King
Natural Resources Defense Council

Rob Smith
Sierra Club

The National Coalition to Stop Cliff Dam is comprised of 6 national environmental groups representing 5.4 million members and supporters: the Environmental Policy Institute, Friends of the Earth, the National Audubon Society, the Natural Resources Defense Council, the National Wildlife Federation, and the Environmental Defense Fund.

STATEMENT TO BE SUBMITTED FOR
THE RECORD BY CONGRESSMAN ELDON RUDD

ENERGY AND WATER DEVELOPMENT
APPROPRIATIONS SUBCOMMITTEE

APRIL 10, 1986

Record Statements have been submitted by Mr. Robert Witzeman, President of the Maricopa Audubon Society, Ms. Charlene Dougherty, Director of Legislation for the National Audubon Society, and Mr. Edward R. Osann, Director of the Water Resources Program for the National Wildlife Federation, which were critical of the construction of Cliff Dam on the Verde River in Arizona, as part of the Plan 6 feature of the Central Arizona Project. The criticism centered around three main themes: 1) that Cliff Dam is not needed for flood control; 2) that Cliff Dam would be environmentally damaging, especially as to the Desert Bald Eagles which nest near the Cliff Dam site; and, 3) that dam safety on the Verde River can be accomplished without construction of Cliff Dam by constructing an emergency auxillary spillway for Bartlett Dam as a less costly alternative.

Cliff Dam would result in the flood flows from a 200 year flood to be reduced from 275,000 cfs to 92,000 cfs (and with additional fixes to existing structures that can further be reduced to less than 65,000 cfs) according to statistics provided by both the Army Corps of Engineers and the Bureau of Reclamation. Estimated flood damage, not including the effect on land values in the Salt-Verde River Valley, would be reduced from $56 million to $12.8 million. The Secretary of the Interior has placed the Salt and Verde Dams on a priority list for safety of dams work because of their vulnerability to failure under current criteria. The Safety of Dams expenditures for Cliff Dam, which represents only a portion of the total construction cost, is less than the estimated costs of repair for the other two dams on the Verde River. Although the Safety of Dams legislation precluded expenditures for construction of "new facilities", Cliff is not a "new facility" within the meaning of the legislation. Furthermore, Congress should not be precluded from saving money by constructing Cliff Dam, with much greater overall benefits including the dam safety considerations, rather than spending more to fix two dams which provide only safety of dam benefits.

The Federal Government has spent in excess of $30 million to address the environmental concerns of Central Arizona Project construction. The State of Arizona has appropriated $2 million in a mitigation fund for the Desert Bald Eagles, once Cliff Dam construction begins. The U. S. Fish and Wildlife Service and the Arizona Game and Fish Department have expressed support for Cliff Dam. The proponents of Cliff Dam are well aware of their responsibilities towards prudent resource development.

THURSDAY, APRIL 10, 1986.

ANIMAS-LA PLATA PROJECT, COLORADO

WITNESS

JAMES DECKER, TAXPAYERS FOR ANIMAS-LA PLATA REFERENDUM

Mr. BEVILL. Mr. James Decker.

Mr. DECKER. Mr. Chairman, members of the committee, my name is James Decker, and I am a member of the Taxpayers for Animas-La Plata Referendum, which is a group in opposition to the project and has been for the past seven years.

Chairman Bevill, we met on your last trip to the Dolores project, and you invited me to come and submit my material, and now I am the sole representative this afternoon, because Mrs. McCulloch and Mrs. Englert had to return home.

Mr. BEVILL. We are delighted to have you with us. If you have a statement from them, we will put that in the record.

Mr. DECKER. Yes, I do, Mr. Chairman, and I have my own statement, which I would like to summarize.

Mr. BEVILL. We will make them part of the record, and you may just summarize and proceed as you wish.

Mr. DECKER. Yes, sir, I will be happy to do that.

I want to make some points for my own submission, my own statement. The first point is that recently and belatedly there was a poll commissioned by the district to determine the amount of local support for the Animas-La Plata project.

I am submitting for the record an article which corroborates the evidence and say to you the telephone poll indicated that there was 46 percent for the project in the beneficiary area, the district of the beneficiaries, there was 39 percent against, and there is 14 percent undecided, indicating that there is merely a seven percent plurality favoring this project. And so this is the first time we have heard this data in the seven years, and this is not the poll which would have constructed a firm sampling, but we view it as our obligation, as opponents to this project, to turn that around in the repayment contract. But I would like to indicate to you this afternoon there is not overwhelming support for the project.

The second piece of information I am going to indicate for the record, Chairman Bevill, is there is new information since you traveled here, and it is contained in a petition that is being circulated on the Dolores area by a farmer in this area, his name is J.R. Hollen, and he was here this morning and left this petition with me. I have copies for everybody on the committee.

This petition recognizes that they are members of the 1977 signers to create the Dolores District, and they are asking for relief as a consequence of a study done by CSU, which I have attached, or which Mr. Hollen has attached, saying and indicating to those signers they can afford to convert to the kind of equipment they will need to accept the pressurized water from the Dolores system. And I submitted both this—there are about 100 signatures on Mr. Hollen's petition, and there are 177, I believe, that signed originally. Mr. Hollen assured me this morning he could get almost 100 percent of the people that are project beneficiaries who want relief,

and the indicated relief they want here is deferment of the project—acceptance of the project and, therefore, deferment of payment for an additional five years.

The reason I thought this was interesting for the Animas-La Plata project, Mr. Chairman, is that we are an irrigation project by and large—Animas-La Plata, too—and if the Dolores project does not prove to be a benefit for the farmers, and the Dallas project doesn't seem to be—there are problems in the Navajo irrigation Indian project, there has been a problem making any money for the people who are farmers there. It seems premature to start another project which has as its objective the same products that will be produced by the projects that are already Federally sponsored.

What we are asking in my statement is that the Appropriations Committee deny appropriations for this year until such time as the Department of Interior can examine the effects of existing Federal projects on the market.

I have a student—I am a professor at Fort Lewis College—from that area, and he told me this is as far as he knows the only project which has devalued the farmland. Because what they have to do, according to the study, is put $350 worth of equipment on every acre, and they can't find anybody who will finance that kind of thing. The situation is they can't sell the products on the farmland now, how can they sell the increased products with the irrigation kind of technology?

So I would ask you to consider this statement from J.R. Hollen and the attached CSU report on why it is so expensive for them. So if the irrigation project is not a beneficiary to Dolores, I am making the argument it is not going to be a benefit for Animas-La Plata, and I do indeed know there are more benefits of the project than simply agriculture.

The second is for municipalities. And I would like to point out, Mr. Chairman, Durango, my home town, is the largest city in the service area, and Durango commissioned a blackened beach report, that is the name of it—that report to the city said the city's water rights were good for the foreseeable future even against possible Indian water rights claims. And, as a matter of fact, the project admits it would be cheaper for Durango to do its own water project than to go with the Animas-La Plata project. Durango is going with the project now on the grounds it will be an area benefit.

It points out the blackened beach report, also under contract in Bloomington, New Mexico, said they could go with their own projects cheaper than paying the $19.8 million and the $3 million for interim water they are presently scheduled to pay to go with the present project. So the municipalities prepare for themselves.

The third objective would be Indian water rights. We met with the Indian Water Rights Committee and the Cost Sharing Committee, asking them to consider lesser design proposals. Our answer was that we didn't want to forestall the present design, the DPR, because that would require a new DPR and EIS. It turns out in the course of the negotiations, they are in fact changing the facilities. They are enlarging the Ridges Basin. The reason they are enlarging the Ridges Basin is because the Indians asked to defer their own reservoir and place their water requirement allocations in the

Ridges Basin, meaning a physical change would have to be accomplished. It has to be a bigger basin.

In addition to that——

Mr. BEVILL. Your time is up. Can you wrap it up?

Mr. DECKER. Yes, sir.

At any rate, I think there is a lesser alternative. My fifth point is that we have, and I am submitting it, an analysis of the La Plata project cost sharing proposal. You know, the law is that the local area must come up with reasonable cost sharing, and this analysis suggests it is not reasonable cost sharing and indeed not what they say it is. They say the local non-Federal short costs share will be 238 million and our analysis indicates because of deferred projects, it is really closer to 36 million, and, therefore, is not in conformance with the law that requires a reasonable cost sharing.

I would be glad to submit any other information on the subject, Mr. Bevill.

Mr. BEVILL. All right. If there are no questions, thank you very much. I appreciate the fine presentation you have made.

[The statements of James C. Decker and Jean McCulloch follow:]

STATEMENT OF JAMES C. DECKER
BEFORE THE ENERGY AND WATER DEVELOPMENT
SUB-COMMITTEE ON APPROPRIATIONS
UNITED STATES HOUSE OF REPRESENTATIVES
WASHINGTON, D.C.
April 10, 1986

Mr. Chairman and Members of the Committee:

My name is James Decker and I am a college professor at Fort Lewis College, located in Durango, Colorado, which is in the proposed service area of the Animas-La Plata Project. In addition, I am a member of the Taxpayers for an Animas-La Plata Referendum (TAR), a group from the service area which has consistently opposed the Animas-La Plata Project for the past seven years. This week, Mr. Lewis Matis, the chairman of TAR, and Mrs. Tom McCulloch, Vice Chairman, among others, were in Washington, D.C. these past few days, but regretably, due to personal committments, were unable to appear before this committee today. They have, however, submitted statements for the record. I urge the Committee to give careful attention to their statements. Unlike the statements and appearances of proponents for the Project, many of whom are public officials, these sincerely dedicated citizens are not here at public expense. The opponents, like myself, have paid their own way to make these representations to their government. These citizens have no economic state in the outcome of the Animas-La Plata Project, other than as taxpayers; they are opposed to unnecessary and inefficient expenditures of their governments. Their counsel is like the advice in the physicians oath, "Above all, do no harm."

Recently and belatedly, the Animas-La Plata District commissioned a public opinion poll to determine the local support for the Project. The construction of the poll is not what we would have liked-it failed to emphasize the costs of the Project. But even in their poll-and considering this was among the targeted beneficiaries of this federal generosity-support for the Project was only 46% for, 39% against and 14% undecided. Thus, after years of promoting this large economic infusion into an area that could certainly use a boost, the supporters of this project could produce a bare plurality of seven percent. If the United States Congress votes this appropriation for the Animas-La Plata Project, it will be generating as many ingrates as supporters for its efforts. Needless to say, for our part we will be doing everything we can do to point out the deficiencies of this Project to turn around the seven percent plurality before the vote on the repayment contract.

Why the opposition to this supposed economic benefit? It is true that the same poll indicated that the people of Southwestern Colorado want to have more jobs for the people in the area. What we understand is that capital intense water projects do not achieve this objective, certainly not in relationship to the costs. The Dolores Project did not improve the economy of that area, one of

the most depressed in the state. You will be receiving testimony from a farmer in that area asking the federal government to delay payment on the dryland part of the project. The farmers there understand that if they can't sell their products now, they will not be able to sell increased production in the future to pay the increased costs associated with irrigation farming. Before spending money on new starts, the federal government should be assured that its previous projects, such as the Navajo Indian Irrigation Project, Dallas Creek and the Dolores Project are economically beneficial. The irrigation portion of the Animas-La Plata Project will increase the production of agricultural products in a market that is already flooded by the production of other federal projects. Governmental policy is making the plight of the farmer worse. It is inconsistent for the federal government to be taking agricultural land out of production in the farm bill and increasing the stock of irrigated farm land by new starts in water projects. The Animas-La Plata is not needed for agricultural purposes.

Nor is it needed for the municipalities. Durango, the largest city in the service area commissioned its own study called the Black and Veatch Report. That report said the city's water rights were good for the forseeable future even against possible Indian Water Rights claims. As for the cities of Farmington, Aztec, Bloomfield and Shiprock, the $19.8 million scheduled for payment by New Mexico to the Animas-La Plata, plus the $3 million for interim water delivery could be better spent for New Mexico purposes if and when the need should arise.

It is said by the proponents that the Animas-La Plata Project will solve the Indian Water Rights issue, and so it will, but there are less costly alternatives that will accomplish the same results. We asked the cost sharing-Indian water rights negotiating team to consider design alternatives as part of the negotiations. Absent a justification for municipal or irrigation needs, this course of action, reducing the size of the project and the costs, seemed justifiable. We were told that, given the limited time available, the negotiators would not discuss less costly alternatives. But the design has been changed, specifically to enlarge the Ridges Basin Reservoir and increase the capacity of the Durango pumping station while putting the Southern Ute Reservoir on indefinite hold. All of these changes have been made without benefit of a new Definite Plan Report or a new Environmental Impact Statement. Unfortunately, the changes are in the direction of a larger project, whereas the needs for Indian storage could be satisfied by a much smaller facility. Our suggestion to the negotiators was to satisfy the only remaining need for an Animas-La Plata Project, that is Indian water storage, by building the Southern Ute Reservoir and a gravity fed diversion from the Animas River to the Reservoir. The Ute Mountain Ute requirements can be fully satisfied from the existing Dolores River Project. The costs of this project would be less than one-third the existing plan and satisfy any possible historical equity claim existing as a consequence of the 1968 Animas-La Plata authorization. We urge this Committee to deny any appropriations for the Animas-La Plata Project until the United States Department of Interior has had an opportunity to study lessor alternatives that could be constructed to satisfy the lone remaining objective of supplying the Ute tribes with water storage facilities.

Durango Herald 1/24/96

Survey shows support for A-LP

By Barry Shuldt
Herald City Editor

A telephone survey indicates 48 percent of registered voters favor building the controversial Animas-La Plata Water Project, compared to 39 percent who would vote against it.

The slight edge encouraged supporters of the proposed $822 million project, but the 14 percent who remain undecided about the project apparently will be the key if an election is held later this year.

"At the moment, the project has a plurality of support," said pollster Paul Talmey. "It's not a clear one, but it exists.

"The campaign is going to be fought over this small number of (undecided) people," Talmey told the Animas-La Plata Water Conservancy District board on Thursday. "There's not much there."

The poll represents the first measure of sentiment about the much-debated water project that would be built just southwest of Durango if voters approve it.

The poll of 516 registered voters in the Animas-La Plata Water Conservancy District was conducted between Dec. 18 and 21 by Talmey Associates, a Boulder research firm best known for its Denver Post/NewsCenter 4 political polls. It was commissioned by the water district for $6,000.

The district includes that portion of La Plata County along the Animas Valley from Purgatory to just south of Durango, and most of the southwest portion of the county. In the event of an election, only those in the district would vote on the water project and only those in the district would be taxed directly if the project is approved.

The survey has a margin of error of plus or minus 5.5 percent.

In 10-minute interviews that included more than 50 questions, pollsters learned that most voters in the water district hold deep opinions on the project that aren't likely to change.

"This has been hashed out in the public for so long that the people who want to make up their mind already have made up their mind," said Talmey.

Of the people who said they would vote for the project, 56 percent said they were strongly in favor of it. Of those who would vote against, 70 percent were strongly opposed to the project.

Reasons for favoring the project included its effect on the local economy by providing jobs, the need to supply water for the Durango area and the water it would provide for irrigating farmland.

Opposition to the project centered on its cost, concern about its effect on taxes and, to a much lesser degree, concerns about the environment.

When undecided voters were pressed as to which way they were leaning, 49 percent said they could be swayed to vote for the project, compared to 25 percent who said

(Please see A-LP POLL, Page 10)

ANIMAS-LA PLATA SURVEY

If the election were held today, would you vote FOR or AGAINST building the Animas-La Plata Water Storage Project?

Vote FOR	48%
Vote AGAINST	39%
Undecided	14%
No answer	1%

Would you say you strongly (FAVOR/OPPOSE) or only moderately (FAVOR/OPPOSE) the proposed Animas-La Plata Water Storage Project?

Strongly	55% (For), 70% (Against)
Moderately	45%(For), 30% (Against)

Even though you are undecided, as of today do you lean more toward voting "FOR" or more toward voting "AGAINST" the proposed water diversion project?

Lean to YES	49%
Lean to NO	25%
Undecided/not leaning	12%
No answer	14%

Some people don't pay a great deal of attention to issues and elections. How about you? Would you say that you are very much interested, somewhat interested or not much interested at all in following the Animas-La Plata Water Storage issue.

Very much interested	52%
Somewhat interested	41%
Not much interested	6%
No answer/refused	1%

Water district hires PR man

Following on the heels of a poll indicating it needs to get more information to voters, the Animas-La Plata Water Conservancy District hired an expert to help them.

The board voted Thursday to hire Durango resident Jim Tuch as its public information officer in preparation for an election on the Animas-La Plata Water Project.

Tuch, who said he compiled 20 years experience in advertising, politics and marketing before moving to Durango two years ago, is to direct the district's campaign to get approval of the proposed $822 million federal water project.

His job will be "to educate people on all the nuances of the project" using local media as much as possible but also using advertising, direct mailings, public meetings and speeches to civic clubs.

Tuch is to be paid $2,000 a month, with his contract to end when the election is held. No date has been set for the election, but board members foresee one in the next six months.

The contract also includes a research assistant at $900 a month.

The Animas-La Plata Water Conservancy District has a $25,000 budget for an election campaign. The Southwestern Colorado Water Conservation Board also has a budget of $35,000 for promotion of the project, which is to include helping the Animas-La Plata district to pay Tuch and to help pay for lobbying by Ray Kogovsek, former 3rd District congressman.

Tuch said he would be using a poll conducted by Talmey Associates that indicates most district residents are aware of the project but don't have a firm understanding of it.

STATEMENT OF JEAN MCCULLOCH
BEFORE THE ENERGY AND WATER DEVELOPMENT
SUB-COMMITTEE ON APPROPRIATIONS
UNITED STATES HOUSE OF REPRESENTATIVES
WASHINGTON, D.C.
April 10, 1986

Mr. Chairman and Members of the Committee:

I am Jean McCulloch, vice chairman of Taxpayers for the Animas-La Plata Referendum, an organization that has actively opposed the construction of the Animas-La Plata Project since 1979.

I am asking that the Animas-La Plata Project receive zero funding for FY 1987.

One of the most serious problems associated with water project development is the absolute power and unlimited financial resources of the non-elected water boards who lobby relentlessly for old dreams. These boards do not represent the people whose tax dollars fuel their lobbying efforts; and more importantly, they have failed to recognize a changing world.

Through the years this committee has heard their testimony, pleading for Animas-La Plata construction funds to fend off a water crisis in southwest Colorado. We believe the only crisis is the project itself.

A local engineer is fond of saying, "The Animas-La Plata Project is a solution in search of a problem." The problem, as seen by the proponents of the project, has been eliminated by engineering and legal studies, population growth that did not materialize and diminishing markets for agricultural products and coal. In other words, there is no demonstrated need for the project that cannot be solved by scaled down, more cost effective alternatives, alternatives that do not bankrupt the federal, state and local taxpayer.

The Agreement in Principle, recently sent to the Secretary of the Interior, is one more misleading attempt to convince Washington that the Animas-La Plata Project solves Indian water claims and provides up-front cost-sharing by Colorado and New Mexico. It does neither.

The mythical $238 million in up-front funds is an economist's nightmare. For instance, the cost of deleted project features and money not available until the eleventh year of construction are being offered as up-front funds! To make matters worse, New Mexico has not even signed the Agreement.

The Agreement in Principle does not settle Indian water claims for it is the Indian features of the project that are being deleted. Furthermore, neither the Dolores nor the Animas-La Plata Project is considered Winters doctrine water. Does this mean that the Ute Tribes at some future date can demand more water projects to settle their Winters claims? The Dolores Project did not satisfy Ute Mountain Ute claims; the Pine River Project and the Florida Project did not settle Southern Ute claims. The question remains.

Recent history has shown what happens when bad projects are funded. The Dallas Creek Project, once the efforts of intensive lobbyirg, is not needed now. Population projections were wrong, cheaper alternatives were developed and conservation measures cut down on usage. The federal taxpayer was once again responsible for picking up the cost overruns when Senator Armstrong and former Representative Kogosvek were successful in getting a cap put on the amount the local water users would pay for project water.

The Dolores Project suffers the same fate as the Dallas Creek Project. Population projections were wrong , so municipalities are questioning the need for the water. Recently the irrigators started circulating a petition to extricate themselves from the burden of paying for the supposedly "cheap" project water.

The Animas-La Plata Project has additional baggage attached to it. It is a power consumer, using 165 million KWH of energy yearly to pump water uphill approximately 900 feet in elevation. The viability of the project depends on the future availability of cheap power rates. If those rates go up, it would mean financial disaster for the project. The federal taxpayer will be paying for one more water project in southwest Colorado that was not needed in the first place.

You are hearing the voice of the people now, not the lobbyist. And the people are saying that no one can afford federal water projects such as the Dallas Creek, Dolores and the Animas-La Plata. Let's not make a third mistake in southwest Colorado. It's time to put old dreams to rest by not funding the Animas-La Plata Project.

59-750 O—86——37

ANIMAS-LA PLATA PROJECT COST-SHARING PROPOSAL

March 14, 1986

As stated, a total of $238 million offered by Colorado/New Mexico

I. HARD & SEMI-HARD CASH

1. $30 m (Colorado Water Resources & Power Development Auth.)

2. 6 m (Colorado Water Conservation Board)
$36 m*

*The $6 m. from the water conservation board is contingent upon passage of SB67, which would allow that board to fund all, rather than half, of a particular project. Status of bill unknown.

II. BLUE SMOKE & MIRRORS

1. $218 m. of Colorado M&I

a.) 14.5 m deferred

b.) 7.3 m promised (by sale of revenue bonds, 11th year of construction.)

2. All Indian M&I and irrigation repayment deferred.*

*Deferment of Indian irrigation water is always deferred under the Leavitt Act and thus should not be considered as "upfront cost-sharing."

3. $81.8 m offered as cost-sharing is actually the cost of the deferred Indian irrigation and M&I facilities.

4. $61.4 m., New Mexico share of the project.*

*New Mexico, however, has not signed the Agreement in Principle.

5. $0.2 m, local project beneficiaries*

*Has not been ratified by the local boards to the best of our knowledge.

6. $5 m,, Colorado State Legislature*

*Was to have come from revenues generated by a .4-cent sales tax. The tax was killed February 12, 1986.

7. O,M&R costs*

*O,M&R cannot be offered as upfront cost-sharing of construction costs of a reclamation project.

Table 4

Animas-La Plata Project Financing/Cost-Sharing Proposal-
Ute Indian Tribes Reserved Water Rights Settlement
($ millions)

Item	(1) Existing Federal Obligation	(2) Proposed Cost Sharing Non-Federal	(3) Proposed Cost Sharing Federal	(4) Present Worth of Repayments
	(Oct. 1985 Unit Prices)			
A. Animas-La Plata Project:				
1. Non-Indian Muni & Industrial Water				
Colorado	$ 21.8	$ 7.3	$ 14.5	$ 5.1
New Mexico	19.8	19.8	0	0
Subtotals	41.6	27.1	14.5	
2. Indian Muni & Industrial Water				
Colorado - So. Ute Dam & Res.				
Staged Construction		43.0		
Interest During Construction (IDC)		4.3		
New Mexico Irrig. Canal		2.4		
Portion of So. Ute Inlet Canal		1.5		
Portion of So. Ute Inlet Canal IDC		0.1		
Subtotals	114.9	51.3	63.6	22.3
3. All Other Costs				
Colorado				
Non-Indian Irrigation	241.2			5.6
Indian Irrigation	72.4			0.4
Ute Mountain Ute Irrig. Construction including drains staged (excluding non-Indian lands)		30.5		
Enlarge Durango Pumping Plant	3.2			
Enlarge Inlet to Ridges Basin Res.	2.4			
New Mexico				
Non-Indian Irrigation	38.6			1.6
New Mexico Interim Facilities	3.0			
Non-Reimbursable Items:				
Fish & Wildlife Mitigation	5.2			
Fish & Wildlife Enhancement	12.4			
Cultural Resources	17.5			
Recreation	9.8			
4. Other Sources of Funding				
Colorado				
State of Colorado and Colorado Water Resources & Power Development Authority		$ 48.0		
Local Project Beneficiaries		0.2		
New Mexico				
Interim Facilities pending So. Ute Res.		3.0		
Subtotals	405.7	81.7	324.0	
5. Operation, Maintenance & Replacement				32.1
6. TOTAL - Animas La Plata Project	$ 562.2	$ 160.1	$ 402.1	$ 67.1
B. Tribal Development Funds:				
Colorado				
1. Towaoc Water Pipeline - Dolores Project	4.2	4.2	0	0
2. Towaoc Distribution Sys. & Res. Storage	1.8	1.8	0	0
3. Other Related Resource Development	54.5	5.0	49.5	
Subtotals	60.5	11.0	49.5	67.1
Total Capital Costs	$ 622.7	$ 171.1	$ 451.6	
Reduction in Federal Outlays Under States' Proposal		$ 171.1		
Present Worth Values		67.1		
GRAND TOTAL NON-FEDERAL COST SHARE		$ 238.2		

In 1977, we, the undersigned, signed a contract with the Bureau of Reclamation for irrigation water from the Dolores River Project. We felt this would be to the mutual benefit of ourselves and the people, in that, at the time, irrigation would have been economically feasible for us and the project was a needed project for the area economy in general and our contract was some help in justifying the building of the project.

Circumstances completely beyond our control have now not only made irrigation economically not feasible, but if we are unable to either be released from our contract or provided some kind of relief from it, it will spell disaster for us by putting us out of farming completely.

The 9 years since we signed the contract has seen the price of our farm produce in this area go down drastically. The cost of farm machinery in general has gone up approximately 400% with the prices of the sprinkler systems themselves raising from 150% to 200%. Our fuel and general operating expenses have risen about 300% to 400%. Availability of capital for agricultural purposes has drastically diminished and interest rates have gone from 8-9% to 16-18% currently. The general agricultural economy has meant that, at best, we are only breaking even--certainly not accumulating capital that would be available for purchase of new equipment that will be required for the addition of irrigation to our operations.

Even the price we were told we would be charged for the water and maintence itself has escalated substantially. Originally, we were told that the cost would be projected at approximately $11.50 per acre, but, the maximum cost would be approximately $17.90 per acre. Now the projected cost is close to $35.00-$40.00 an acre. The cost of water being $1.65 and the remaining balance allocated to operation and maintenance. Now we are faced with an assessment for the water that will destroy us if we don't use it, but even worse, with the cost of equipment, interest, increase in general operating expenses, and lower produce prices plus the price of the water, if we use it, there is absolutely no way we can survive if we are held to the terms of the contract.

Currently, ASCS-USDA allows for a 50% cost share for revamping existing irrigation systems, but nothing for new systems. We are not even allowed this option. Due to the current farm economics, we feel a variance should be allowed in this situation.

Not being people who go back on our word we have investigated every possibility we can think of to figure a way to uphold our agreement. We feel that we certainly are not responsible for any of the changes we have mentioned nor were we in any position to fore-see them happening. Under these circumstances we must appeal for relief from these contracts as they are written or through re-negotiation.

We are enclosing copies of cost analysis from Colorado State University and our local Soil Conservation Service verifing our position.

Sincerely,

Name	Address	Post office
R. R. Hollen Jr	Box 231	Pleasant View Colo
Flavi Hollen	Box 362	Pleasant View Colorado
Gilbert Stewart	Box 144	Cahone, Co 81320
Frederick A. Slick	Box 315	Pleasant View, Colo. 81331
Leroy Olivas	9588 CR CC	Pleasant View Co "
L. G. Olivas	PO Box 259	Pleasant View Colo. 81331

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Name	Address	Post Office
A [illegible]	P.O 391	Pleasant View Colo
Maybell Waymon		Pleasant View Colo
Howard Hyatt	Box 773	Cortez Colo
J P Johnson	Box 94	Cahone Colo
Malina Johnson	Box 94	Cahone, Colo.
Jimmy Fulton	Box 287	Yellow Jacket Colo 81335
Edward L Kennedy	Box 224	yellow Jacket Colo 81335
Jean Williard	Box 393	Yellow Jacket Co 81335
Russel Fullerton	Box 264	Yellow Jacket Colo 81335
Lynal Mowery	Box 301	Yellow Jacket Colo 81335
Joe L Mahaffy	Box 214	yellow Jacket, Colo 81335
[illegible]	Box 314	yellow Jacket Colo 81335
Margery E [illegible]		yellow Jacket Co. 81335
Tony Mahaffy	Box 319	Yellow Jacket Co 81335
Dale W Minshall	Box 335	Pleasant View Colo 81331
Brian Wilson	25227 Co Rd M	Pleasant View, CO 81331
[illegible]	Box 343	Pleasant View, Co 81331
Wayne & Bessie [illegible]	8799 Co Rd	Pleasant View 81331
Helen Halladay	14205 County Rd. CC	Pleasant View 81331
Raymond McTavish	Box 306	Yellow Jacket Co 81335
K L & Lois Forbes	Box 286	Yellow Jacket Co 81335
Lloyd C. Hostler	Box 223	Pleasant View Co. 81331
Louis Lucas	Box 271	yellow Jacket Co. 81335
Dale Lucas	Box 271	Yellow Jacket Co. 81335
Lynn Reed	Box 313	yellow Jacket Colo 81335
Joyce Reed	Box 313	Yellow Jacket, Colo. 81335
Kenneth Lucas Dry	Box 265	Pleasant View Colo
Bill Lamunyon	PO 363	Pleasant View 81331

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Name	Address	Post Office
Hewell Okie	Yellow Jacket Co	81335
Billy D Watson	18930 CR 23.5	Dolores Colo
Robert L Kennedy	P.O. Box 943	Yellow Jacket Co.
George Terry	Box 304	Dove Creek Colo
Lida Bertenwell	1211 N Broad St	Colby Colo
Mr & Mrs Elston Johnson	Box 311	Pleasant View
Lonnie Young Jones	Box 322	Pleasant View
Rodger D Jones	Box 232	Yellowjacket 81335
Mrs Inez	Box 284	Yellowjacket Box 81335
Wayne & Linda Gulston	Box 265	Yellowjacket Colo
Mr & Mrs Gather Wilson	Box 252	Yellowjacket Co.
Irene Bertram	18460 Co Rd 39.5	Dolores Colo
Gil Lancaster	731 Canyon Dr	Cortez Colo
Renay Neely	Box 99	Cahone, Colo 81320
Ruth Powell	1848 Hopi Cattle Creek Rd	Carbondale Colo 81623
Wanita Martin	15947 Co Rd 17	Cortez Co 81321
Holden & Anita	9136 RD. BB	Pleasant View 81331
Hesper & Mildred	9136 RD. BB	Pleasant View 81331
James H Dawn	Box 125	Eckert Colo 81320
Imogene Dawn		Cahone, Colo. 81320
Darrell Hall	29705 Hwy 666	Pleasant View Co
Clarence & M Reed	801 N. Chestnut	Cortez Colo 81321
Emma Jo Reed	801 N. Chestnut	Cortez Colo 81321
James L Hanks	Box 261	Yellowjacket Colo 81335
Cindy Hanks	Box 261	Yellowjacket Co 81335
Martha A Reed	Box 296	Yellowjacket Co. 81335
Roberta Wood	Box 296	Yellowjacket Co 81335
S.L. Norton	Box 344	Pleasant View Co 81331
Dana Norton	Box 344	Pleasant View, Co 81331

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Name	Address	Post Office
Dick [illegible]	Box 118	Dove Creek Co 81324
Irene Tapia	Box 1	Dove Creek Co 81324
Charlotte O'Berg (Orchard)	Box 86	Mimbres, New Mexico 88049
Lowell Campbell	405 N. Park	Carter Co 81321
Marcia Campbell	405 N. Park	Carter Co. 81321
Peter M. Talcott	115 N Harrison	Carter Co 81321
Marian H. Talcott	115 N. Harrison	Carter Colo 81321
Ike & Thelma Duncan	6411 SO. Broadway #D	Carter
Wayne Rogers School	430 S. Lincoln	Carter Co 81321
Clarence R. Upton	19420 #666	Lewis Colo 81327
Lula Belle Upton	19420 #666	Lewis Colo 81327
Charles A Campbell	16678 Rd 22	Cortez Colo. 81321
Edwin Campbell	16678 Rd 22	Cortez Colo. 81321
DeEtte Johnson	10953 C Rd 22	Cortez, Colo 81321

March 31, 1986

Dear Sirs:

I am aware of the petition and its contents to put off for 5 years or until the economy improves or re-negotiate the contracts are signed until the Bureau of Reclamation - Delaware River Project.

I would like to add my signature to this petition.

Beatrice Seelig
1107 Allyn St
Akron, Ohio 44311

I agree 100% with E. E. Holden Jrs. petition on the Delaware River Water for irrigation. That is supposed to go to our farms. So I will sign this petition with my signature on this letter in favor of the petition.

Joe Ambiton

Draft for Review
4/1/86

SUMMARY OF

"ECONOMIC ASPECTS OF UTILIZING DOLORES PROJECT WATER"

by

Roger L. Mann
Adrian Fisher
and
Robert A. Young

Mann is a Research Assistant and Young is a Professor, Department of Agricultural and Natural Resources Economics, Colorado State University. Fisher is an Associate Professor of Agronomy, stationed at Southwestern Colorado Agricultural Research Center, (Colorado State University), Yellow Jacket, Colorado.

ECONOMIC ASPECTS OF UTILIZING DOLORES PROJECT WATER

GENERAL SUMMARY

The Dolores Project is a nearly-completed U.S. Bureau of Reclamation multipurpose water supply project under construction near Cortez in southwestern Colorado. About 20,000 acres will receive supplemental irrigation water and about 28,000 acres previously in dryland crops or grazing will be fully irrigated. Water deliveries are scheduled to begin for parts of the service area in 1987.

During the several years since the water users and the federal government agreed to proceed with the project, a number of changes have appeared in the economic outlook for producers. The most important of these changes is the well-publicized decline in commodity prices experienced since about 1981. Meanwhile, costs of irrigation equipment, wages for hired labor, interest rates and energy costs have risen. An issue of emerging importance is the continued increase in the forecasted charges which the Bureau of Reclamation will levy on water users once the project is delivering water. The operating and maintenance ("O and M") segment of the repayment must reflect the actual expenses realized by the government, and these costs have been continually revised.

The report summarized here was developed in response to a request from potential Dolores Project water users. The research objective was to identify potential production and market opportunities and to determine the most economical crops and farm plans under the expected agronomic and economic conditions facing producers. Eleven years of research experience on the CSU experimental farm within the project area provided much information on crop yields and potential management problems.

Production Considerations

Climate - The project service area lies at elevations mostly exceeding 6,000 feet. Frost-free growing periods range, on the average, from 112 to 140 days, but very late spring frosts and very early fall frosts occur with some frequency. The short season limits feasible crops primarily to forages (alfalfa, pasture), small grains, and edible dry beans. Corn, Colorado's most prevalent irrigated crop, is thought to be too risky.

Soils and Topography - The area to be newly irrigated has mostly medium to heavy soils with good water-holding capacity. The terrain is sloping and frequently broken by gullies. As a consequence, fields are likely to be relatively small and surface irrigation will be largely precluded.

Irrigation Technique - In recognition of the above considerations, the Project will deliver water piped under pressure for use in sprinklers. Side-roll sprinklers are judged to be the most suitable for the smaller fields and heavier soils. The initial investment would be about $300 per acre. Side-rolls, however, require more labor. Center pivot sprinklers are more expensive, initial investment beginning at $400 per acre for half-mile diameter fields, but rising rapidly in cost for smaller field sizes typical of the project area. Center pivots are adapted to taller crops (corn silage or sunflowers) and require less labor, but often encounter operating difficulties on heavier soils. Center pivot sprinklers are judged to be suitable only for a very limited number of project farms, and are not discussed further in this summary.

The initial investment, $60,000 or more for a 200 acre farm, will likely prove difficult to-finance for those producers who might be in an already weak financial situation from the persistently weak market for crops.

Feasible Crops - The soil and growing season considerations noted above indicate the most feasible crops from the production viewpoint are forages (alfalfa, pasture grasses), edible dry beans (pintos), and small grains (wheat, barley). (These are the crops proven to be adapted in the past, and most growers will be familiar with their production.) Root crops (i.e., potatoes) will likely yield lower quantities and qualities and experience high harvest costs on the heavier soils typical of the area.

Market Considerations

Producers in southwestern Colorado shared in the general agricultural prosperity of the 1970s. However, the 1980s has been a period of precipitously declining crop prices. The authors see little prospect for return to strong profitability in the next decade or so, although some minor improvement from present disastrous prices is possible. Three factors will govern commodity price outlook for southwestern Colorado producers.

First, the international market for food commodities is characterized at present by a large over-supply relative to demand. The high prices of the 70s, in a fashion similar to such cyclical peaks in the past, called forth a large increase in production capacity. The trend to encourage market-like institutions in formerly centrally planned and/or highly regulated nations (China, India) plus technological advances will continue to add to productive capability, and a closer balance between supply and demand will likely be some time in appearing. U.S. export opportunities for wheat and beans are particularly damaged by the economic crisis in Latin America.

Second, policies at the national level are moving in the direction of lower prices and redirecting crop production capacity. Feed grains (corn, barley, oats) and their close substitutes (hay, forage) are likely to continue to be under pressure. Federal policies aimed at reducing food and feed grain

output threaten to shift marginal lands in the northern tier of states into edible dry bean production, making the outlook for that crop's price even more unfavorable.

Third, local market conditions in southwest Colorado show little promise for a brighter outlook. The remoteness from markets limits prospects for higher income specialty crops (e.g., fresh vegetables). A shift into more hay production in the Navaho Project area (immediately south in New Mexico) has hurt the alfalfa market in the region. Further south, farmers in Arizona and New Mexico have shifted some of their cotton lands into hay and feed grain production due to unfavorable fiber markets. Locally depressed prices for feedstuffs might attract some growth in livestock feeding. If this were to occur, it would possibly strengthen, but not save, the feed-grain forage market in the area.

Production Costs

Table 1 summarizes our estimates of cost of production per acre and per unit of product for three likely crops in the Dolores service area. The major assumptions underlying the budget are: irrigation with a side-roll sprinkler; field size is 40 acres; total farm size is 225 irrigated acres and wages are $5.00 per hour.

Potential Crop Yields

Based on experience at CSU's San Juan Branch Research Center, we project yield per acre under irrigation of the three most likely crops to be:

alfalfa hay : 5 tons per acre

pinto beans : 15 cwt per acre

spring wheat: 50 bu per acre

Table 1. Summary of Costs of Production for Selected Crops, Dolores Project Service Area ($/ac.)

Item	Pinto Beans	Alfalfa Hay	Spring Wheat
	$	$	$
Land Preparation and Plant	56	62[a]	38
Other Pre-Harvest Machine Operations	23	14	10
Fertilizer and Pesticides	28	10	31
Irrigation Operating Costs	14	20	15
Irrigation Water Repayment	21	39	23
Irrigation Equipment Annual Charge	37	37	37
Harvest and Haul	37	139	28
Other (overhead, taxes, and misc.)	26	29	22
Interest on Land (10% of 500.)	50	50	50
TOTAL COST PER ACRE	292	400	255
Projected Yields (per acre)	15 cwt	5 T	50 bu
Cost Per Unit for Zero-Profit Breakeven	$19.50/cwt	$80/T	$5.10/bu
Projected Selling Price Per Unit	$16/cwt	$65/T	$3.50/bu
Profit (Loss) Per Unit	$(3.50)/cwt	$(15)/T	$(1.60)/bu

[a]Alfalfa stand establishment cost amortized over four year life.

Other Crops Tested

A number of other crops were subjected to the cost and returns budget test similar to that shown in Table 1. These included malt barley, oats, grass seed and potatoes. None of these was found to be particularly promising due to high production costs relative to expected revenues.

Potential Crop Prices

The most uncertain aspect of the feasibility of irrigation is probably the expected prices for crops. The prices shown at the bottom of Table 1 reflect the writers' judgments for average prices over the next few years, based on experience of the last several years and expected future trends. Actual prices received could easily vary 25 percent up or down from those provided.

Potential for Livestock-Crop Combinations

The profitability of incorporating various forms of livestock production into the new irrigated production situation was also considered. Backgrounding or fattening calves or lambs has promise of using farm produced hay and forage and crop aftermath, and offers off-season employment or family labor.

However, pending more detailed analysis, we believe the high cost of producing feeds on project lands (due to the investment in irrigation facilities and the high cost of water) would make livestock production also too expensive to compete in the marketplace. Any potential livestock producer would find feed less expensive in the regional market than producing it with Dolroes Project water, so it appears unlikely that many would find this an attractive alternative.

Conclusions

We find no crop production alternative which will have a high probability of yielding a profit on the new Dolores Project lands, given present the outlook for crop prices, productivity and the terms of the existing repayment contracts. Financing the investment in irrigation equipment will be difficult for all but those landholders with substantial asset holdings in addition to their farm business resources.

DOLSIDI

ALFALFA-EST./SIDE ROLL

TOTAL CROPLAND ACRES	40.0	EXPECTED YIELD PER ACRE	1.0
ACRES THIS CROP BUDGET	40.0	ANIMAL UNITS OF GRAZING	0.3

OPERATION	ACRES /HOUR	PURCHASED MATERIALS AMOUNT /ACRE	PURCHASED MATERIALS COST /UNIT	MACHINERY COSTS FUEL AND LUBE	MACHINERY COSTS REPAIR AND MAINT	MACHINERY COSTS FIXED	TOTAL COSTS
MOLDBOARD PLOW	3.00			3.08	2.65	7.37	13.09
TANDEM DISC	7.50			1.23	0.75	2.84	4.82
TANDEM DISC	7.50			1.23	0.75	2.84	4.82
CHISEL	9.00			1.03	0.87	2.07	3.97
GRAIN DRILL	4.50			2.05	0.79	2.96	5.80
SEED		10.00	2.00				20.00
BROADCAST SPREADER	CUSTOM						0.0
PHOSPHORUS		132.00	0.21				27.72
SELF-PROPELLED WINDROWER	10.00			0.59	0.51	1.90	3.01
BALER,GIANT	3.50			1.81	0.53	2.35	4.68
TWINE		1.00	6.50				6.50
LABOR		2.00	7.50				15.00
BALE WAGON AND STACKER	3.50			1.81	0.56	2.35	4.72
IRRIGATION,SIDE ROLL SYSTEM							
31.3 IN. APPLIED	150.00*			0.50	3.50	72.00	76.00
WATER		31.30	1.75				54.77
TOTALS				13.34	10.92	96.66	244.91

* - MINUTES OF LABOR/ACRE

CASH COSTS		
PURCHASED MATERIALS	122.80	
FUEL AND LUBE	13.34	
REPAIRS AND MAINTANANCE	10.92	
CUSTOM HIRE AND MACHINE RENTAL	0.0	
INTEREST ON OPERATING EXPENSE	11.12	
(148.25 X 15.00% FOR 6.0 MONTHS)		
TOTAL CASH COSTS		158.38
LABOR		
DIRECT LABOR	19.70	
(4.1 HRS X 4.00/HR X 1.2 (OVERHEAD))		
TOTAL CASH COSTS AND LABOR		179.07
FIXED COSTS		
FIXED MACHINERY COSTS (INCLUDES INTEREST AT 15.00%)	96.66	
REAL ESTATE TAXES	7.00	
INTEREST ON LAND ($ 0.0 VALUE/A X 12.00% X 1.0)	0.	
TOTAL FIXED COSTS		103.66
TOTAL COST, EXCEPT OVERHEAD AND MGT.		282.73
OVERHEAD AND MANAGEMENT		
OVERHEAD (TOTAL CASH COSTS X 5.00%)	7.97	
MANAGEMENT CHARGE ($ 0.0 X ESTIMATED YIELD)	0.0	
TOTAL OVERHEAD AND MANAGEMENT		7.97
TOTAL COST PER ACRE		290.70
TOTAL COST PER UNIT OF PRODUCTION (BASED ON ESTIMATED YIELD)		290.70
ESTIMATED RETURNS		
ESTIMATED CROP RETURN PER ACRE	70.00	
ESTIMATED AUM GRAZING RETURNS	2.50	
ESTIMATED TOTAL RETURN PER ACRE		72.5
ESTIMATED NET RETURN PER ACRE	-218.20	

Amortize 5 yr @ 15% = $65.09 Annual establishment cost

DOLSIDS
WHEAT-SIDE ROLL

TOTAL CROPLAND ACRES 126.0 EXPECTED YIELD PER ACRE 70.0
CRES THIS CROP BUDGET 126.0 ANIMAL UNITS OF GRAZING 0.5

OPERATION	ACRES /HOUR	PURCHASED MATERIALS AMOUNT /ACRE	PURCHASED MATERIALS COST /UNIT	MACHINERY COSTS FUEL AND LUBE	MACHINERY COSTS REPAIR AND MAINT.	MACHINERY COSTS FIXED	TOTAL COSTS
ANDEM DISC	7.50			1.22	0.91	3.46	5.60
HISEL	9.00			1.03	0.87	2.07	3.97
OD WEEDER	15.00			0.62	0.71	2.08	3.41
RAIN DRILL	4.50			2.05	0.91	3.45	6.41
SEED		65.00	0.13				8.45
ROADCAST SPREADER	CUSTOM						0.0
NITROGEN		135.00	0.31				41.85
PHOSPHORUS		25.00	0.21				5.25
ELF-PROPELLED SPRAYER	CUSTOM						3.00
HERBICIDE		1.00	5.00				5.00
ELF-PROPELLED SPRAYER	CUSTOM						3.00
INSECTICIDE		1.00	5.50				5.50
OMBINE,GRAIN HEAD	CUSTOM						17.00
RUCK	CUSTOM						9.00
TOR/SHRINK/CLEAN	0.0 *			0.0	0.0	13.00	13.00
IRRIGATION,SIDE ROLL SYSTEM							
22.3 IN. APPLIED	100.00*			0.50	3.50	72.00	76.00
WATER		22.30	1.75				39.02
TOTALS				5.43	6.89	96.07	245.46

* -MINUTES OF LABOR/ACRE

CASH COSTS
PURCHASED MATERIALS 149.07
FUEL AND LUBE 5.62
REPAIRS AND MAINTANANCE 6.89
CUSTOM HIRE AND MACHINE RENTAL 30.00
INTEREST ON OPERATING EXPENSE 11.20
(149.39 X 15.00% FOR 6.0 MONTHS)
TOTAL CASH COSTS 160.60

ABOR
DIRECT LABOR 10.54
(2.2 HRS X 4.00/HR X 1.2 (OVERHEAD))
TOTAL CASH COSTS AND LABOR [illegible]

FIXED-COSTS
FIXED MACHINERY COSTS (INCLUDES INTEREST AT 15.00%) 96.07
REAL ESTATE TAXES 7.00
INTEREST ON LAND ($1000.00 VALUE/A X 0.0 % X 1.0) 0.00
TOTAL FIXED COSTS 103.07
TOTAL COST, EXCEPT OVERHEAD AND MGT. 274.20

OVERHEAD AND MANAGEMENT
OVERHEAD (TOTAL CASH COSTS X 5.00%) 8.03
MANAGEMENT CHARGE ($ 0.0 X ESTIMATED YIELD) 0.00
TOTAL OVERHEAD AND MANAGEMENT 8.03
TOTAL COST PER ACRE 282.26
TOTAL COST PER UNIT OF PRODUCTION 4.03
(BASED ON ESTIMATED YIELD)

ESTIMATED RETURNS
ESTIMATED CROP RETURN PER ACRE 262.50
ESTIMATED AUM GRAZING RETURNS 5.00
ESTIMATED TOTAL RETURN PER ACRE 267.50
ESTIMATED NET RETURN PER ACRE -14.76

Less plans

DOLSID3

DRY BEANS--SIDEROLL

TOTAL CROPLAND ACRES	40.0	EXPECTED YIELD PER ACRE	14.0
ACRES THIS CROP BUDGET	40.0	ANIMAL UNITS OF GRAZING	0.5

OPERATION	ACRES /HOUR	PURCHASED MATERIALS AMOUNT /ACRE	PURCHASED MATERIALS COST /UNIT	MACHINERY COSTS FUEL AND LUBE	MACHINERY COSTS REPAIR AND MAINT.	MACHINERY COSTS FIXED	TOTAL COSTS
CHISEL	9.00			1.03	0.78	1.92	3.73
FIELD CULTIVATOR	7.50			1.23	0.79	2.41	4.43
CHISEL	9.00			1.03	0.78	1.92	3.73
FIELD CULTIVATOR	7.50			1.23	0.79	2.41	4.43
PLANTER (SEED ONLY)	3.00			2.11	1.23	3.15	6.49
SEED		50.00	0.30				15.00
BROADCAST SPREADER	CUSTOM						0.0
ZINC		5.00	1.00				5.00
PHOSPHORUS		21.00	0.21				4.41
ROW CROP CULTIVATOR	3.50			1.81	1.41	2.97	6.19
SELF-PROPELLED SPRAYER	CUSTOM						3.00
HERBICIDE		1.00	7.50				7.50
ROW CROP CULTIVATOR	3.50			1.81	1.41	2.97	6.19
STRO/SHRINK/CLEAN	0.0 *			0.0	0.0	25.00	25.00
BEANCUTTER	3.00			2.11	1.02	3.70	6.83
SIDE DELIVERY RAKE	3.00			2.11	0.56	2.12	4.80
COMBINE,PICKUP	CUSTOM						15.00
TRUCK	CUSTOM						5.00
IRRIGATION,SIDE ROLL SYSTEM							
19.6 IN. APPLIED	85.00*			0.50	3.50	72.00	76.00
WATER		19.61	1.75				34.32
TOTALS				14.97	12.29	130.57	237.06

* - MINUTES OF LABOR/ACRE

CASH COSTS

PURCHASED MATERIALS	86.32	
FUEL AND LUBE	14.97	
REPAIRS AND MAINTANANCE	12.29	
CUSTOM HIRE AND MACHINE RENTAL	73.00	
INTEREST ON OPERATING EXPENSE	6.72	
(116.49 X 15.00% FOR 6.0 MONTHS)		
TOTAL CASH COSTS		193.32

LABOR

DIRECT LABOR	15.69	
(3.5 HRS X 4.00/HR X 1.2 (OVERHEAD))		
TOTAL CASH COSTS AND LABOR		141.93

FIXED COSTS

FIXED MACHINERY COSTS (INCLUDES INTEREST AT 15.00%)	124.57	
REAL ESTATE TAXES	7.00	
INTEREST ON LAND ($ 0.0 VALUE/A X 12.00% X 1.0)	0.0	
TOTAL FIXED COSTS		131.57
TOTAL COST, EXCEPT OVERHEAD AND MGT.		269.49

OVERHEAD AND MANAGEMENT

OVERHEAD (TOTAL CASH COSTS X 5.00%)	9.66	
MANAGEMENT CHARGE ($ 0.0 X ESTIMATED YIELD)	0.0	
TOTAL OVERHEAD AND MANAGEMENT		9.66
TOTAL COST PER ACRE		279.15
TOTAL COST PER UNIT OF PRODUCTION (BASED ON ESTIMATED YIELD)		19.94

ESTIMATED RETURNS

ESTIMATED CROP RETURN PER ACRE	260.00	
ESTIMATED AUM GRAZING RETURNS	0.00	
ESTIMATED TOTAL RETURN PER ACRE		260.00
ESTIMATED NET RETURN PER ACRE	-18.75	

Per Year

COST ESTIMATE - SIDEROLLS

Landowner _____ Field number 1&2

Prepared by Steve Russell Date 3-86

PIPELINE

2700 feet of 8 inch 80 PSI PVC at 1.90 per foot		5130
420 feet of 6 inch 80 PSI PVC at 1.10 per foot		462
18 risers at 110 each (based on 120 foot maximum spacing)		1980
Trenching, installation, etc. at 1.50 per foot		4680
Contingencies (Air vents, drains, valves, etc) - 15%		1838
	Subtotal	14,090

SPRINKLER

1040 feet of 5 inch sideroll with mover FIELD 1		6540
1000 feet of 5 inch sideroll with mover FIELD 2		6380
_____ feet of _____ inch sideroll with mover		_____
_____ pressure regulators at _____ each		_____
	Subtotal	12,920

FIELD 1 40.17 Ac

FIELD 2 38.46 Ac

TOTAL 27,010

Acres served 78.6

Cost per acre 343.64

COST ESTIMATE - SIDEROLLS

Landowner _____ Field number Field 4

Prepared by [redacted] Date 3-86

PIPELINE

1500 feet of 6 inch 100 PSI PVC at 1.30 per foot		1950
_____ feet of _____ inch _____ PSI PVC at _____ per foot		_____
12 risers at 110 each (based on 120 foot maximum spacing)		1320
Trenching, installation, etc. at 1.50 per foot		2250
Contingencies (Air vents, drains, valves, etc) - 15%		828
	Subtotal	6348

SPRINKLER

1040 feet of 5 inch sideroll with mover		6540
_____ feet of _____ inch sideroll with mover		_____
_____ feet of _____ inch sideroll with mover		_____
_____ pressure regulators at _____ each		_____
	Subtotal	6540
	TOTAL	12,888

Acres served 35.7

Cost per acre 361.01

RECEIVED

APR 14 1986

APPNS. CMTE.

STATEMENT OF LOUISE VOELKER, TAXPAYER
LAPLATA COUNTY, COLORADO
BEFORE THE ENERGY AND WATER DEVELOPMENT
SUB-COMMITTEE ON APPROPRIATIONS
UNITED STATES HOUSE OF REPRESENTATIVES
WASHINGTON, D.C. 20515
April 2, 1986

Mr. Chairman and Members of the Committee:

I am Louise Voelker, a taxpayer of LaPlata County, Colorado. I plea strongly you **do not fund a third major water project for SW Colorado, namely ANIMAS-LAPLATA WATER PROJECT.** It is not economic to farm here as shown and not needed as settlement for Indian water claimed as there are much cheaper alternatives which require no energy for pumping. [This project is an energy consuming water project and needs Federal energy assistance from funds the Federal Gov't contemplates selling off to reduce our deficit.]

LaPlata County has a population of only 33,000 and already has two major water projects! The ALP irrigator would pay $33 to $53 per acre for water supply. These Project users would definitely be bankrupt in a short period of time when considering a cost of ALP water and a gross crop value as derived from the present Florida or Pine River Water Projects from this county.

Attached are the Bureau of Reclamation crop production & water utilization summaries for 1984 for these two water projects. Briefly stated:

Florida - **GROSS crop value per irrigated acre, $145.23**

Pine - **GROSS crop value per irrigated acre, $82.80**

[Also included is sheet 5 which shows these people received a whopping 5.54 acre-feet of water per the acre from the Pine and still only grossed $82.80 per the acre. They had 52,161 AF in ditch loss or approx. 1/4 of total supply was lost. Sheet also indicates 1000 AF was a municipal supply for the Town of Ignacio, the Southern Ute Indian headquarters. Please also notice there was no project water delivered during 1984. There was plenty of water: a water project unused in 1984!]

Pine Indian - **GROSS crop value per irrigated acre, $76.60**

[This is the So. Ute Indian part of the whole Pine River Water Project. I might add the Agreement in Principle which is being promoted by Senator Armstrong and Rep. Strang both Republicans incidently **has no mention of this water project as being part of So. Ute Indian settlements for Winter's Doctrine claims!** Conveniently disregarded I believe.]

The Navajo Indian Tribe water issue was not considered in the Agreement in Principle signed March 14, 1986 by our local proponents. The Tribe is allocated 7600 AF from the ALP Project. However the delivery point is at Farmington, New Mexico and not to their reservation where they plan a new city. Their concern is that the project will misapply water to which they feel they are entitled. Legal manuvers have been in progress a number of years. The Bureau said they are constrained by the provisions of the Co. River Compact apportionment of water to each state. Nonetheless, **the Navajo water issue is not settled even if the ALP is built!**

Other Municipal & Industrial users all have cheaper alternatives. Attached is a Bureau water supply study for the proposed storage reservoir to be located in Colorado for New Mexico M&I. In that 49-year study period it shows the number of times water would have been released for New Mexico use. Notice all the zeros where they didn't need storage water simply because they had all the water they needed already flowing down the river to them. In that 49-year study New Mexico water from Ridges Basin Reservoir was used only one-half the time and then for some of those years only 100 AF was released! Since this project was designed, their local storage has been increased. And Durango never did need a Federal water project neither.

Again for everyone's sake & especially the increasing Federal deficit. **do not consider funding the Animas-LaPlata Water Project.** These water projects have over-run costs consistently; where they project a construction cost of $553M in reality it will be **one billion** by completion date. None of us can afford such ill-thought out Federal projects. This one is simply not economical. Why just last Sunday in our local paper an article stated on the front page that the farmers who signed up for the Dolores Water Project, presently being built in our next county, are circulating a petition to the Bureau begging to get out of their contract for irrigation water. They say now they cannot afford that project; they want somebody else to take their assigned water. What a shame they hadn't arrived at that conclusion before the dam was built.

Louise Voelker
12849 CR 250
Durango, Colorado 81301

1984

CROP PRODUCTION AND WATER UTILIZATION DATA FOR 19 84

SHEET 1 OF 6

Subdivision	State	Region
Florida	Colorado	UC

☐ Full ☒ Supplemental ☐ Temporary

ACREAGE SUMMARY

ROTATION (Acres)	CLASS 1-1 (13-21)	CLASS 5 (22-30)	TOTAL (31-40)
pasture (from Line 194)	14,462		14,462
and soil building	502		502
11 & 12)	14,964		14,964
	1,585		1,585
Rotation (Cultivation)(Lines 13 + 14)	16,549		16,549
TION ROTATION (Acres)			
ow or grazed	1,928		1,928
ches, drains	973		973
ation Rotation (Lines 16 + 17)	2,901		2,901
N LANDS	0		0
EA FOR SERVICE (Lines 15 + 18 + 19)	19,450		19,450
EA NOT FOR SERVICE	0		0
EA (Lines 20 + 21)	19,450		19,450
LY IRRIGATED			

CROP VALUE SUMMARY

	(22-30)	
from Line 194) TOTAL VALUE		2,173,248
E		0
TS	0	0
	0	0
nue (Lines 33 + 34)	0	
crop value plus additional revenue - Lines 31 + 35) TOTAL VALUE		2,173,248
CREAGE (from Line 13) TOTAL IRRIGATED ACREAGE		14,964
e IRRIGATED ACRE (Line 36 — Line 37) AVERAGE VALUE PER IRRIGATED ACRE		145.23

GROSS

NUMBER OF FARMS AND POPULATION

	NO. OF FARMS OPERATING UNITS (13-21)	IRRIGABLE ACRES FOR SERVICE (22-30)	POPULATION (31-40)
Full service farms - Crop average 149 acres	71	10,603	241
	34		
	258	8,847	1,236
		0	0
AN LANDS (acres from Line 19)			
ne 20) TOTAL ACRES	329	19,450	1,477

1984

CROP PRODUCTION AND WATER UTILIZATION DATA FOR 19 84

SHEET 1 OF 6

Subdivision	State	Region
ne River	Colorado	UC

[ ] Full [X] Supplemental [ ] Temporary

ACREAGE SUMMARY

...n ROTATION (Acres)	CLASS 1-4 (13-21)	CLASS 5 (22-30)	TOTAL (31-40)
...d pasture (from Line 194)	25,376		25,376
...d and soil building	3,090		3,090
...11 + 12)	28,466		28,466
	1,095		1,095
...n Rotation (Cultivation)(Lines 13 + 14)	29,561		29,561
ATION ROTATION (Acres)			
...low or grazed	8,592		8,592
...itches, drains	1,488		1,488
...gation Rotation (Lines 16 + 17)	10,080		10,080
AN LANDS	0		0
REA FOR SERVICE (Lines 15 + 18 + 19)	39,641		39,641
REA NOT FOR SERVICE	1,639		1,639
REA (Lines 2 + 21)	41,280		41,280
...LY IRRIGATED			

CROP VALUE SUMMARY

	(22-30)	
...(from Line 194) TOTAL CROP VALUE		2,356,878.00
UE		
...nts	0	0
	0	0
...evue (Lines 33 + 34)	0	0
...s crop value plus additional revenue - Lines 31 + 35) TOTAL VALUE		2,356,878.00
...CREAGE (from Line 13) TOTAL IRRIGATED ACREAGE		28,466.00
...R IRRIGATED ACRE (Line 36 ÷ Line 37) AVERAGE VALUE PER IRRIGATED ACRE		82.80

GROSS per A

NUMBER OF FARMS AND POPULATION

	NO. OF FARMS CONTRIBUTING UNITS (13-21)	IRRIGABLE ACRES IN SERVICE (22-30)	POPULATION (31-40)
Full Time Farms Average 160 acres	195	31,234	477
45	186	8,407	408
...HAN LANDS (acres from Line 19)			
...ne 20) TOTAL (1 & 2)	381	39,641	885

CROP PRODUCTION AND WATER UTILIZATION DATA FOR 19 84

SHEET 5 OF 6

Subdivision	State	Region
River	Colorado	UC

☐ Full ☒ Supplemental ☐ Temporary

NET SUPPLY 1/	OPERATIONAL SPILLS	TRANSPORTATION LOSSES	NONAGRICULTURAL DELIVERIES		DELIVERED TO FARMS	ACRE FEET PER ACRE
			MUNICIPAL INDUSTRIAL	MISCELLANEOUS		
(13-21)	(22-30)	(31-39)	(40-48)	(49-57)	(58-66)	[redacted]
PROJECT WATER (Acre Feet)						
NONPROJECT WATER (Acre Feet)						
210,903	0	52,161	1,000		157,742	5.54
210,903	0	52,161	1,000		157,742	5.54

ANNUAL OPERATION, MAINTENANCE AND REPLACEMENT COSTS (Whole Dollars)

AGRICULTURAL	MUNICIPAL & INDUSTRIAL	OTHER	TOTAL ALL FUNCTIONS
(13-21)	(22-30)	(31-39)	[redacted]
0	0	0	0
121,788.00	0	0	121,788.00
121,788.00	0	0	121,788.00

DRIP AND SPRINKLER IRRIGATION (Whole Numbers)

d (13-21)	564	[redacted]
21)	0	

1/ There was not any project water delivered during 1984.

NEW MEXICO NO.1 SUPPLIED FROM HIGHER BASIN RESERVOIR

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1929	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1930	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1931	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.4	0.0	0.0	0.0	0.0
1932	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1933	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1934	0.0	0.0	0.0	.0	0.0	.2	0.0	2.8	0.0	0.0	0.0	0.0
1935	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1936	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1937	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1938	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.2	0.0	0.0	0.0	0.0
1939	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1940	0.0	0.0	0.0	0.0	0.0	0.0	1.1	2.3	0.0	0.0	0.0	0.0
1941	0.0	0.0	0.0	0.0	0.0	0.0	.8	.6	0.0	0.0	0.0	0.0
1942	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1943	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1944	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1945	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1946	0.0	0.0	0.0	.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1947	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1948	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1949	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1950	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	0.0	0.0	0.0	0.0
1951	0.0	0.0	0.0	1.0	0.0	0.0	0.0	.4	.5	0.0	0.0	0.0
1952	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1953	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0	0.0	0.0
1954	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1955	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.4	0.0	0.0	0.0
1956	0.0	0.0	0.0	0.0	0.0	0.0	.8	2.8	3.3	.5	0.0	0.0
1957	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1958	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1959	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1960	0.0	0.0	0.0	.1	0.0	0.0	.4	0.0	1.4	0.0	0.0	0.0
1961	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	.5	0.0	0.0	0.0
1962	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1963	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1964	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.4	0.0	0.0	0.0	0.0
1965	0.0	0.0	0.0	0.0	0.0	0.0	.7	.3	0.0	0.0	0.0	0.0
1966	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1967	0.0	0.0	0.0	0.0	.1	0.0	.1	0.0	0.0	0.0	0.0	0.0
1968	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1969	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.5	0.0	0.0	0.0	0.0
1970	0.0	0.0	0.0	0.0	.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1971	0.0	0.0	0.0	.0	.3	0.0	0.0	0.0	.7	0.0	0.0	0.0
1972	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1973	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1974	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1975	0.0	0.0	0.0	0.0	0.0	0.0	1.1	2.9	0.0	0.0	0.0	0.0
1976	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1977	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	2.8	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	1.8	.9	0.0	2.9	0.0	.0	0.0	0.0	0.0
AVRG.	0.0	0.0	0.0	.1	.0	.0	.2	.0	.2	.0	0.0	0.0

4 years 400 cu-feet etc

THURSDAY, APRIL 10, 1986.

PORTUGUES & BUCANA RIVER PROJECT, PUERTO RICO

WITNESS

JORDY BOFILL, ASSISTANT EXECUTIVE DIRECTOR FOR ENGINEERING PUERTO RICO AQUEDUCT AND SEWER AUTHORITY

Mr. BEVILL. Next we have Mr. Jordy Bofill.

Mr. BOFILL. Good afternoon, Mr. Chairman. My name is Jordy Bofill, Assistant Executive Director for Engineering of the Puerto Rico Aqueduct and Sewer Authority. I come today to testify in support of the fiscal year 1987 energy and water development appropriation bill and in particular on the Corps of Engineers' Portugues and Bucana Rivers flood control project under construction in Ponce, Puerto Rico.

Before presenting my testimony, and on behalf of the Resident Commissioner of Puerto Rico, Congressman Fuster, who has been detained at an Interior Committee hearing for Puerto Rico, I would like to introduce for the record his remarks on water projects in Puerto Rico. He sent his profound apologizes for not being able to deliver these remarks in person in support of the water projects under consideration by this subcommittee.

I will proceed now with my statement. Since 1975, the Commonwealth of Puerto Rico entered into a partnership with the Federal Government, through the U.S. Army Corps of Engineers, in developing the Portugues and Bucana Rivers Project in Ponce, Puerto Rico. This project was designed to provide much needed relief against the floods from the two streams and which has held the development of the City of Ponce, Puerto Rico's second urban area. In addition, the project would provide much needed municipal and industrial water supplies to this semi-arid region of our island.

Current total project cost estimates are divided into 52 percent local and 48 percent Federal, when pay back of the allocated costs to water supply are included. Since the start of construction, Puerto Rico has made every possible effort to maintain the project on schedule. Early in the process, the lands for the channels and reservoirs were identified and restrictions placed on their use and development so that land acquisition costs could be maintained low and reduce the needs for relocation. Also, in the early 1980s, when the Commonwealth was undergoing economic difficulties from uncontrolled worldwide inflation, funding to the project was maintained at levels to support its progress.

Because of the original concerns by both ourselves and the Congress, the project was authorized as three projects in the Flood Control Act of 1970. This was meant to enable Puerto Rico to better fund the project with its limited resources.

At the same time, the Puerto Rico Aqueduct and Sewer Authority embarked on a major program of constructing waste water treatment plants and related trunk sewers in response to the requirements of the Clean Water Act amendments of 1972 and 1977. As the chairman is well aware, the requirements for meeting the clean water goals of the nation have been changing, increasing the economic burdens on local governments to treat its waste waters.

PRASA and Governor Hernandez Colon's administration is fully committed to achieving these goals. To this end, we have allocated in excess of $1 billion to bring the Authority in compliance with the Clean Water Act within the next four years.

It now appears that current efforts in continuing with the Portugues and Bucana Rivers project may be hindered by an incorrect interpretation of the Congressional intent in authorizing the project under the Flood Control Act of 1970. The current interpretation by the administration is that each of the two reservoirs must be considered as separate projects, even though the channels and the two dams were designed and meant to function as one single project.

The interest rate for repayment of the water supply from the Cerrillos Dam was established at 6.063 percent in the 221 Agreement signed in March, 1982. This would provide for an untreated water source at a cost of about $0.50 per 1,000 gallons. The administration considers, however, that the Portugues Dam should be developed at the current interest rate of 11.07 percent, or an estimated cost of about $1.50 per 1,000 gallons. This new proposed rate is higher than the going rate of 7.92 percent for the Treasury notes (year 2009) and the rate of 9.30 percent for municipal bonds.

Under other circumstances, the Commonwealth could be in a better position to finance the water supply portion of the project at a lower interest rate than 11.07 percent. However, because of the requirements of meeting the Clean Water Act requirements, we have already committed over $400 million in bond issues backed by PRASA and the Commonwealth with little or no additional bonding capacity left. Because of our current economic situation and because a different interest rate for the Portugues Dam would mean a dramatic change in the project, we request from the committee that a clarification of the Congressional intent of the Flood Control Act of 1970 be included in your legislation so that the project may be continued under the same arrangements as at present with the Cerrillos Dam.

The Commonwealth of Puerto Rico is committed to the continuation of the P&B project. We feel, however, that the water supply development of the Portugues Dam would be extremely difficult to support under a proposed 11.07 interest rate. We need to request that all project features be completed as initially engineered, authorized and funded by Congress. The floods of last October demonstrated the need for the two reservoirs to insure a degree of protection needed for a highly developed urban area such as the City of Ponce. At that time, and with most of the channels in place, a 35-year flood almost overtopped the improvements in place.

I thank you for this opportunity to testify before this committee. I am available for any questions you may have.

Mr. BEVILL. Very good. A very good statement. No questions. Thank you very much.

[The statement of Hon. Jaime B. Fuster follows:]

JAIME B. FUSTER
PUERTO RICO

Congress of the United States
House of Representatives
Washington, DC 20515

TESTIMONY OF HON. JAIME B. FUSTER BEFORE THE HOUSE SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT ON APPROPRIATIONS FOR WATER RESOURCES PROJECTS FOR FISCAL YEAR 1987

April 10, 1987

Mr. Chairman and members of this distinguished subcommittee. I am Jaime B. Fuster, Resident Commissioner from Puerto Rico, and I have the honor of appearing before you today to set forth the funding requirements for the various studies and projects undertaken by the U.S. Army Corps of Engineers in Puerto Rico.

Some of the projects which I will discuss here today are on-going, and have been included in the Corps' Fiscal Year 1987 Budget Request. One such is the Portugues and Bucana Project, for $31,000,000. This project was authorized by the Flood Control Act of December 30, 1970. It consists of channel improvements and two high dams with reservoirs. The two dams will store water for flood control, water supply and recreation. The project will essentially provide flood protection and a dependable water supply of about 33.8 million gallons per day to the city of Ponce, the largest city on our South coast.

I wish to express my concern over the start of the Portugues Dam, which is a part of this project. Originally, Portugues-Bucana was authorized as three separate projects encompassing the channels, Cerrillos Dam and Portugues Dam. This was done primarily to facilitate the financing of local requirements by the government of Puerto Rico. It is my understanding that there has recently been some discussion as to whether Portugues Dam should be considered a new start project, thereby requiring a higher interest rate on the payback for the municipal water supplies included in that multi-purpose reservoir. I would like the subcommittee to consider this matter, and recommend that the current interest rate for payback for the Cerrillas Dam be applied to Portugues Dam.

Similarly, the Ponce Harbor project was authorized by resolutions of the Senate and House Public Works Committees, on October 1, 1976, and September 23, 1976, respectively, under authority of Section 201 of the Flood Control Act of 1965, P.L. 89-298, as amended. It is designed to help expand and develop the commercial and industrial potential of this important southern port city, which is the central distribution point for the entire southern region of Puerto Rico. The project will also stimulate economic development of Puerto Rico's southern and southwestern region. The harbor is located on Puerto Rico's south-central coast, about 150 miles by water southwest of San Juan Harbor. The project provides for a 600-foot-wide by 36-foot-deep channel from the Caribbean Sea to Ponce Harbor, then a 400-foot-wide by 36-foot-deep channel into the harbor, and a 36-foot-deep irregularly-shaped turning basin, with a turning diameter of 950 feet. The cost/benefit ratio of this project is relatively high, at 7.0:1, and the Administration has requested $2,000,000 for construction. These projected improvements to the harbor channels and the turning basins will permit the port of Ponce to accommodate larger vessels than it is able to at the present time. Furthermore, the proposed improvements will form the lynchpin of an overall, integrated development plan for Puerto Rico's entire southern region.

Next, I would like to discuss with you a project of considerable import for Puerto Rico, for the nation, and for the entire Caribbean region. I refer, of course, to the San Juan Harbor Project. San Juan is the most important American-flag port in the Caribbean. It plays a central role in the Administration's Caribbean Basin Initiative as the principal trade link between the United States and the CBI countries. It also plays a key role in the nation's defense, in the area of naval operations. Both the U.S. Atlantic Fleet and NATO use this port during training maneuvers. In May of this year, for example, the armed forces of the United States will join those of Dominica, Grenada, St. Lucia, St. Christopher-Nevis and Antigua-Barbuda in Operation Ocean Venture '86, an exercise designed to demonstrate the United States' ability to project military power into the Caribbean region. This harbor is also of critical importance to our economy, since 80% of all cargo entering or leaving Puerto Rico does so through the Port of San Juan.

The San Juan Harbor port development project will be extensive. It will require deepening the Bar Channel and shifting its alignment 350 feet to the West. Additionally, the project calls for modifications to the Anegada Channel, the Army Terminal Channel, the Puerto Nuevo Channel, the San Antonio Channel, the Cruise Ship Basin, the Sabana Approach, and Anchorage Area E. The project has an estimated cost/benefit ratio of 5.8:1, and is expected to cost $83,000,000, the Federal share of which will be $63,000,000, and the remaining costs to be borne by the Commonwealth of Puerto Rico. Inasmuch as both the House and the Senate have included the San Juan Harbor project in their respective water resource development authorization bills (H.R. 6/S.1567), which are expected to go to conference within a short time, we request that this subcommittee recommend funding this project at the $63,000,000 level.

Several flood control studies in Puerto Rico need funding at this time, including three which have been included in the Administration's funding request.

The Rio Arecibo Project was authorized by resolution of the Committee on Public Works and Transportation, adopted September 23, 1982. The Rio Arecibo basin has historically been subject to large-scale, destructive flooding. The greatest recorded flood ocurred in 1899; the most recent, in 1985. These floods have severely impacted the city of Arecibo, on Puerto Rico's northern coast. As the the urban, industrial and retail center for the whole of Puerto Rico's north-central region, Arecibo is home to almost 90,000 people. The towns of Utuado (35,000 inhabitants), Jayuya (15,000 inhabitants), and Adjuntas (19,000 inhabitants) have also been subjected to the frequent flooding of the Rio Arecibo and its tributaries. This flooding has resulted in extensive property damage, and has caused severe disruption of transportation, communications and socio-economic activities. The Administration has requested $100,000 to study ways in which future disasters in this region may be averted.

Flooding is also a major problem in the Rio Grande de Loiza watershed, the largest on the island. The area most affected is the coastal plain between Carolina and Rio Grande, on the northern coast of Puerto Rico. Some 17,000 families residing in the basin are affected by the floods of the Rio Grande de Loiza and its tributaries. Over 5,000 acres of agricultural land, most of them in pasture for dairy farms, as well as several industrial and commercial facilities within the basin, are subject to frequent flooding. The Rio Grande de Loiza basin is a major source of water for the San Juan Metropolitan Area. At present, the Army Corps of Engineers is examining several alternatives for solving flood protection and water supply problems with the existing Carraizo Dam. The plan that appears to maximize net economic benefits is a combination of two multi-purpose reservoirs on the Rio Grande de Loiza and the Rio Valenciano, a levee along Villa Carolina and Canovanas, a designated floodway running from PR Highway No. 3 bridge to the sea, and limited channel improvements, and localized levees along the Rio Grande de Loiza and its tributaries to protect the towns of Juncos, Gurabo, Caguas and San Lorenzo. The Administration has requested $200,000 to continue this survey.

The Rio Guanajibo study in the western part of the island was initiated under Section 204 of the Flood Control Act of 1970, as amended, as part of the Puerto Rico Cooperative Studies Program. The Rio Guanajibo basin, in the southwestern part of the island includes portions of the municipalities of Mayaguez, Cabo Rojo, Hormigueros, San German, Maricao, and Sabana Grande. Discharges and overflows from the Rio Guanajibo represent a serious threat to life and property in these and adjacent municipalities, which experienced devastating floods during the passage of Tropical Storm Eloise in September of 1975. The study undertaken by the Corps of Engineers is evaluating flood damage protection measures for these municipalities. Although not as serious as the flooding problem, the study is also addressing water supply considerations. The sum of $255,000 is needed to continue this study.

One project which, unfortunately, was not included in the Administration's funding request, is the Puerto Nuevo River project. I say unfortunately, because this is a project of considerable importance to the residents of San Juan. The Rio Puerto Nuevo cuts through the heart of metropolitan San Juan's commercial and financial district, flooding this area with near clockwork regularity. Nearly 6,000 families are affected. The main nucleus of federal and local government facilities on the island, as well as the major transportation network for San Juan are affected. The largest shopping mall in the Caribbean is located in this area; the General Post Office, the National Guard Armory, the Coliseum and the Police Department Headquarters are all located in the basin of the Rio Puerto Nuevo, and all suffer equally from the frequency and regularity with which the Rio Puerto Nuevo overflows its banks. This project was authorized under Section 204 of the Flood Control Act of 1970; the Jacksonville District of the Corps of Engineers completed its report in October, 1984, and the Division Engineer recommended the study in November of that year. Furthermore, on September, 1985, the Board of Engineers for Rivers and Harbors recommended the report for implementation. Because of the urgent need for these flood control works, we request that the subcommittee recommend appropriations for this project in the amount of $1.5 million.

In addition we are requesting funds to initiate a study of the Rio Nigua. The Rio Nigua basin is located in south-central Puerto Rico, and drains a 52.6 square mile area. Most of this watershed lies within the municipality of Salinas, which has a population of 26,000. The river's floodplain encompasses the entire town of Salinas and several adjacent settlements, as well as the southern section of Camp Santiago, a Puerto Rico National Guard training facility. Flooding affects about 200 acres of developed land, and over 800 families, and periodically results in damages in excess of $2 million. The proposed study would determine the scope, extent and severity of flooding in the Rio Nigua basin. I have been advised by Mr. Howard, Chairman of the House Committee on Public Works and Transportation, that this study may be undertaken by the Corps of Engineers under Section 204 of the River and Harbor and Flood Control Act of 1970 (P.L. 91-611). I therefore request that this subcommittee recommend appropriations for this study in the amount of $70,000.

Finally, we would like to express our support for the Administration's funding request for studies under Section 22, Technical Assistance to States. This program has made it possible for Puerto Rico to obtain much needed technical support and professional expertise from the Army Corps of Engineers in the area of water resources management. At present, the Corps is helping the Commonwealth Department of Natural Resources to identify the areas on the island with the greatest and most severe flooding problems

I wish to thank this subcommittee for giving me the opportunity to apprise it of the needs and concerns of the citizens of Puerto Rico. The projects I have described, some of which have already been undertaken by the Corps of Engineers, will have a tremendous impact on Puerto Rico, its economy, and its people.

DEPARTMENT OF NATURAL RESOURCES

APR 11 1986

Mr. Tom Bevill, Chairman
House Appropriations Subcommittee
on Energy and Water Development
Rayburn House Office Building
Room 2362
Independence Avenue
Washington, D.C. 20515

Re: Portugués and Bucaná
Rivers Project, Ponce, P.R.

Dear Mr. Bevill:

Enclosed please find original and fifteen copies of our statement on behalf of the above captioned project.

Very truly yours,

BY: Pedro Campos Delgado
Undersecretary
Alejandro Santiago-Nieves
Secretary

Enclosures

Commonwealth of Puerto Rico, Department of Natural Resources
OFFICE: Muñoz Rivera Avenue, Stop 3, San Juan, Puerto Rico
MAILING ADDRESS: Box 5887, Puerta de Tierra, Puerto Rico 00906

COMMONWEALTH OF PUERTO RICO
DEPARTMENT OF NATURAL RESOURCES

PROJECT: PORTUGUES AND BUCANA RIVERS FLOOD CONTROL
PONCE, PUERTO RICO

SUMMARY: INTEREST RATE FOR REPAYMENT OF WATER SUPPLY FOR PORTUGUES DAM

ACTION PROPOSED TO THE COMMITTEE:

INTEREST RATE OF 6.063% FOR CERRILOS DAM TO BE MAINTAINED AND APPLIED FOR PORTUGUES DAM

Alejandro Santiago-Nieves
Secretary

PROJECT: PORTUGUES AND BUCANA RIVERS FLOOD CONTROL
PONCE, PUERTO RICO

The Portugués and Bucaná Rivers Project in the City of Ponce, Puerto Rico was authorized in three parts by the Flood Control Act of December 30, 1970. Construction of this project by the U. S. Army Corps of Engineers started in June 1975. The Department of Natural Resources of the Commonwealth of Puerto Rico is the local sponsor for the project.

The Commonwealth of Puerto Rico reaffirms its support of the Portugués and Bucaná Rivers Project and its intent to sponsor the entire project, including the Portugués Reservoir. We, however, are deeply concerned about the major differences in the requirements associated with the local cost sharing agreements for the two reservoirs. The interest rate for the repayment of water supply for the Cerrillos Reservoir was established at 6.063% in the 221 Agreement signed in March 1982.

We understand that it is the intention of the Federal Government that the water supply repayment interest rate for the Portugués Reservoir will be set higher.

The Commonwealth has consistently demonstrated its commitment to build both reservoirs. In 1978, when the first lands were purchased for construction work, the Commonwealth placed restrictions on land use at both the Cerrillos and Portugués Reservoir sites. Since that time, the Department of Natural Resources and the Puerto Rico Planning Board have coordinated permit applications for proposed improvements in the area in order to restrict development which could jeopardize successful completion and operation of the total project, including the Portugués Reservoir. It seems clear that by denying property owners full use of lands in the Portugués, as well as the Cerrillos Reservoir, the Government of Puerto Rico has demonstrated an unquestionable commitment to construct both reservoirs. It is important to note at this point that the Portugués and Bucaná Rivers Project is heavily cost shared. Under the terms of the local agreement contracts, in addition to the total cost allocated to water supply, we have provided all lands for the project. We have also borne the costs for relocations of all utilities, bridges and roads. We have also complied with the Uniform Relocation Act. The current estimate for distribution of total final project costs is 52% Local and 48% Federal. As mentioned earlier, under the existing policy, the water supply repayment interest rate for the Portugués Dam will probably be set at a higher rate than for the Cerrillos Dam.

It is essential to Puerto Rico in general, and to the municipality of Ponce in particular, that all project features be completed as initially engineered, and funded as one system. As we saw from the recent disastrous flooding of October 1985, the completed channel works operating alone were inadequate to handle the flood event.

The Commonwealth of Puerto Rico continues its desire to pursue the Portugués Dam, but at the interest rate used for the Cerrillos Dam. It would be extremely difficult to support the Portugués Dam at a higher interest rate because of the high pay back for water supply.

In view of the above, we request that the Subcommittee maintain the interest rate of 6.063% on the unpaid balance for water supply repayment on the Portugués Reservoir.

Alejandro Santiago Nieves
Secretary

THURSDAY, APRIL 10, 1986.

RANDLEMAN LAKE, NORTH CAROLINA

WITNESSES

R. S. DAVIS, DEEP RIVER CITIZENS COALITION
FLOYD LANGLEY, RANDOLPH COUNTY COMMISSIONER

Mr. BEVILL. Mr. Kemp Davis.

Mr. DAVIS. I am his father. He is battling the flu today.

I am going to ask my friend, Floyd Langley, to make the first statement.

Mr. MYERS. Don't you be the East Coast Distributor of the flu.

Mr. LANGLEY. I am Floyd Langley, a full-time farmer from North Carolina. I am presently Vice-Chairman of the Board of Commissioners. I have served on the Board of Commissioners for 12 years.

I would like to speak to you——

Mr. BEVILL. County Commissioners? You are a County Commissioner?

Mr. LANGLEY. Yes, sir.

I would like to speak to you on the funding of the Randleman Dam. As Commissioner, I guess you might hear the Commissioners are for the dam, but it is four-fifths for and one-fifth against it.

I have a few concerns about the Randleman Dam. My main concern is the water quality of the lake.

Mr. BEVILL. The water?

Mr. LANGLEY. The water quality. The river has always had a problem with being one of the worst polluted rivers in North Carolina.

Also, I have another problem. I live in the lower part of the county. This dam will be in the upper part of the county and a several-million-dollar pipeline will be piping sewage and dump just below the dam. At times, I understand 50 percent or more of the flow of the river will be effluent, and I have a very deep concern for people downstream after this dam is built.

I also have a concern over the cost of the project. The people of the government commissioned a firm to do a study last year of the water resources in that area. We determined from that source there was plenty of good clean water in the area of several different alternatives, which would cost half as much as the Randleman Dam to the taxpayer. The local cost would be cheaper, but if you consider all sources, it would be cheaper and take one-third as much land as the Randleman Dam and relocate probably one-third as many people with the same amount of water.

Another concern I have as Commissioner is the local costs on the ratio of funding. I understand there is very much talk about a change from 50 to 68 percent, which would make it hard on the local government to make this project available.

Another problem I have with it is my neighboring county, Chatham County, has the poorest engineering dam built there a few years ago, Jordan Lake, a relatively clean river that wasn't too polluted, but since this dam has been built, there is very serious concern about this water. To treat it would be very expensive even

though the City of Durham has elected to build their own lake in place of using the water from Lake Jordan.

Also Chatham County is shackled with a $200,000-a-year budgetary item of law enforcement and cleanup around the lake, and things of that type, and also tax revenue. Chatham County is having a real problem with these.

So I ask you to look at this project very carefully before you consider putting money in the building of a dam that would be very polluted and lake that would be very polluted which we probably could not use. We have other alternatives that have plenty of water and would cost half as much and would displace probably two-thirds the people.

These people that are having to relocate in the Randleman area are people that would—you know, it is bad enough when you lose your home and you still got your job to work. When you lose your home plus a way of making a living, that is tough. The people are losing their farms. I would just ask you to consider this when you fund the Randleman Dam.

Mr. BEVILL. Thank you very much.

Mr. DAVIS. Thank you very much.

Mr. Chairman, members of the committee, I know the hour is late, and I have several pages I had planned to touch on, but I am not going to do that. I am going to say to you, I am R.S. Davis. I am a farmer in the area you were talking about here where the Randleman Dam project would be. My boys are fifth generation there.

I have been speaking at these hearings for the last 20 years. And we have always said to the people in the affected area, if our farms need to be given up in order that people have water to live on and to prosper on, we are willing to do it. But we really question whether or not this project that we are talking about here, the Randleman Dam project, is a project that is feasible. In the beginning, they talked to us primarily on the idea it was a flood control dam, now it has changed to a water supply dam. That is understandable because of the growth of the area.

But the water itself only covers 3,300 acres. But including the flood control area they are talking about taking, there is 10,000 acres involved. And all the Corps' figures that they have projected are most inadequate. They are not correct, they over-estimated everything. Using the 1973 census to the 1980 census, they projected there would be a 50 percent increase. They over-estimated, by 55 percent, the growth in the area. By 2010, they projected, using their projection, there will be 100,000 less people in there than they project there would be.

So we say the figures are most inaccurate, and we feel like there needs to be some close study made here in regard to this dam before it is constructed. We think it is a bad project for our county particularly. We asked the neighbors to the north in Guilford County needing water sometime down the road, probably in 2020, and we know you have to prepare in advance, but we don't think this is the right project. We are not like Barry Goldwater said here the last time I came to appear before you people, he testified in front of me, and he said there were places in Arizona that were so dry the telephone poles were looking around for a dog. That is not

our case in North Carolina. We have water. Let's be sure that we select the right project, the one that will serve us in the future.

Mr. Langley indicated there is a real question whether this water would be acceptable as a water source in the years to come because the entire watershed is made up in an area that is potentially a high-development area, and that is what the water is needed for is this development, right here in the watershed.

So these non-source pollutants are going to be the problem down the road, and we just want you to take a good close look at this thing before we put bad dollars into it. I mean good dollars into a bad project.

Thank you.

[The statement of R.S. Davis follows:]

To: Members of the Subcommittee on Energy and Water Development

From: The Deep River Citizens Coalition and Citizens Opposed To The Randleman Dam

Date: April 10, 1986

Re: The Funding of The Randleman Dam

Despite other testimony you will receive with respect to the Randleman Dam project, there is extensive opposition to the project. With that in mind, the following concerns are presented:

I. Inaccurate Projections in the Randleman Lake Design Memorandum as prepared by the US Corps of Engineers.

A. Exaggerated Population Figures

According to 1980 Census figures, the Corps of Engineers overestimated population growth in the five-county area of Piedmont North Carolina by 55.3 percent. The key factor here is that by the year 2010 there will be 100,000 fewer people in this area than the Corps of Engineers projected if the census of that year shows the same rate of inaccuracy as the 1980 Census showed.

(E.P.I. The Randleman Dam, N.C. - Chuck Hoffman Report on The Randleman Lake, August 1982, p.8 - Corps of Engineers Design Memorandum, p. 202, Table 3-1)

B. Exaggerated Water Needs

There is not an immediate water supply shortage for the City of Greensboro, the main beneficiary of this project, which could not be addressed by undertaking a simple water conservation program according to a University of North Carolina Water Resources Institute report.

The Corps of Engineers estimates for water usage predict a 43% increase from the year 1975 to 2000. The highest estimates received from the US Water Resources Committee assumes only a 20% increase over the same period. This inflated data would erroneously overstate Guilford County's water needs by a 12.35 million gallons per day in the year 2000.

(E.P.I. The Randleman Dam, N.C. - CH2M Hill Report - Corps of Engineers Design Memorandum)

We would ask the Committee to examine the issue of why the Federal Government would build a $134 million water project to provide 48 million gallons of water per day, when the CH2M Hill study indicated that the year 2020 water demand for the area will only be 18.8 million gallons a day. WHY would we overbuild by a factor of 2.75 in these days of scarce federal dollars?

C. Corps of Engineers estimates of the 1973 value of crops and livestock marketed from the Randleman Site to be $250,000. This is totally unrealistic with current market prices. Chuck Hoffman, Project Director for the Rivers Conservation Fund, Washington, DC, reported in 1982 that agricultural production in the Randleman Take Area amounted to at least $4,175,000 annually.

II. Water Quality Questionable.

As the country is becoming increasingly concerned about water quality problems with respect to drinking water and surface water impoundments, we are increasingly concerned about the potential ticking time bomb we may get if the Randleman Dam is constructed:

A. According to a North Carolina Department of Natural Resource and Community Development Report, the deep River on which the Randleman Dam is to be constructed is "in a severe situation because of alarming concentrations of nutrients, toxic chemicals and metals." Project proponents say don't worry, a pipeline will be constructed around the reservoir so there will be no problem. Our concern is what the sediments of the river hold for our future generations and what will be the affect of numerous waste sites which can be pointed out by local residents which will be covered by water if the lake is built.

B. The Corps of Engineers has a poor track record in North Carolina. Falls Lake near Raleigh and the B. Everett Jordan Lake in Chatham County have had serious problems with water quality. The Jordan Lake which the Corps of Engineers estimated would cost $30,000,000, actually cost $120,000,000 and the water still cannot be used without very expensive treatment.

Steve Tedder, who is affiliated with the NC Division of Environmental Management, assured the Randolph County Commissioners in an open meeting on September 17, 1985, that they could expect a miraculous decrease in pollutants in the waters of Deep River over a three-year period due to the new waste-treatment plants being built in High Point and Jamestown. He said very little about restrictions and cleanup measures for other pollutants. In his February 1985 report, however, he had "stressed the toxicity of the river - amonia, chlorine, copper, nickel, zinc and lead were found in the river bed."

When questioned about this at the September meeting, he stated that further study would probably show that these toxins originate from the waste treatment plants and that the new treatment plants would probably take care of this. This also contradicts his own statement in the Water Quality Evaluation - Upper Deep River Cape Fear River Basin 1983 Report, "However, none of these constituents can account for the measured acute effects. It is probable that other materials are contributing to the toxicity in the Deep River." This gives reason to believe that the geographics of the Randleman Lake could be jeopardized by the fact that it lies directly in the run-off area of High Point and Jamestown municipalities, making non-point source pollution an important factor in the protection of the proposed reservoirs.

(N C Natural Resources Community Development Report, p 3, paragraph 2)

III. Land Acquisition.

Among the inaccurracies of the Corps of Engineers Design Memorandum, is the estimate of the cost of land acquisiton:

A. 700 homesites to be taken at an approximate cost of $2,000 per acre.

B. 9,375 acres of timberland, including the timber, to be taken at a cost of $630 per acre.

The number of homesites within the take area will be much greater than this number and the cost of land is even more rediculous. This is just another example of the tremendous increase in the cost of the Randleman Dam if it is built, (over and above the Corps estimates) which will probably compare to the difference in the cost of the Jordan Lake which cost four times as much as the Corps of Engineers had estimated.

(Corps of Engineers Design Memorandum, Appendix 9, Table 9-2, p. 7)

IV. Alternate Sites.

The DRCC would like to ask why other sites have not been given serious consideration.

A. The Corps of Engineers offered two alternative sites which the DRCC feels should be considered: #1 a smaller reservioir could be constructed on Deep River in the 1980's and another one on Richland Creek in the year 2000. These were found to be considerably more economical than 1 large structure. "Sites 1 and 2, time-phased for construction in 1980 and 2000 respectively, would provide an equivalent water source as needs dictate."

B. Another alternative site would be a dam on Pole Cat Creek near Randleman. Black & Veatch and CH_2M Hill, two responsible consulting firms, examined these alternatives and clearly showed them to be less expensive and more evnironmentally and socially sound alternatives. When the results of studies were presented to the Randolph County Commissioners in September 1985, they were told that the Pole Cat Dam would be more expensive to Randolph County than the Randleman Dam based on the formula for funding which was in affect at that time. This may not be the case if the formula is changed as is being considered to require more of the funds from local governments and less from the federal government.

(Corps of Engineers Design Memorandum, Appendix 9, page 4 - Alternative Water Supply Study For the Upper Cape Fear River Basin CH_2M Hill Report, p. XI)

V. Additional Costs.

The initial cost of pumping 48,000,000 gallons of water per day was estimated at $16,398,000 per year. What would that amount to at todays prices?

Water from the Randleman Lake will not only have to be pumped, it will have to be treated. The cost of treatment facilities range from $10,000,000 to $280,000,000 as evidenced by House loans to municipal governments.

Perhaps the most important fact that both citizens and legislators should be aware of is that this will be an annual cost not included in the cost of the project.

VI. Let's Avoid Another Potential Problem Reservoir in North Carolina.

A Courier Tribune article by Kerry King, (copy included) reported that the Chatham County Commissioners are continuing their struggle with state and federal officials for funding for the B. Everett Jordan Lake. The board plans to ask that a bill be passed in the legislature's next session to provide state funding for services at the 14,000 acre reservoir. The county has been requesting additional state and federal funds to pay for law enforcement, fire protection, garbage collection and other services around the lake, as well as funds to make up the loss of $150,000 in property taxes each year from the tax-exempt project. Chatham County Manager , Marvin Hoffman, has estimated the cost of providing necessary services to the estimated 3,000,000 annual visitors will be $250,000 per year.

The Corps of Engineers has eliminated a $10,000 allocation paid for county services at the lake annually. Hoffman also noted that the federal government was considering eliminating a $30,000 allocation per year to be paid to the county to offset the loss of $150,000 in property taxes.

The DRCC is aware that the size of the Randleman Lake will be considerablly less than the Jordan Lake acreage but it is convinced that the loss of tax revenue would probably be about equal because of the increased land values in the urban area which will be taken if the Randleman Dam is built.

Lake funding struggle continues

By KERRY KING
Courier-Tribune Staff Writer

PITTSBORO — The Chatham County Commissioners yesterday continued their struggle with state and federal officials for funding for the B. Everett Jordan Lake with a new plan to lobby state representatives for financial assistance.

At its bi-monthly meeting yesterday, the board asked County Manager Marvin Hoffman to invite the county's legislative delegation — State Reps. Aaron Barnes and Joe Hackney, D-54th, and state Sens. Russell Walker and Wanda Hunt, D-18th, — to meet with them in early January to discuss the problem.

The board plans to ask that a bill be passed in the legislature's next session to provide state funding for services at the 14,000 acre reservoir, which opened in 1982.

"We have to look to the state for some assistance," County Attorney Robert Quan told the board. "I don't think the federal government will help."

The county has been requesting additional state and federal funds to pay for law enforcement, fire protection, garbage collection and other services around the lake, as well as making up the loss of $150,000 in property taxes each year from the tax-exempt project.

The county's efforts to date have not been successful in receiving a funding commitment from the state or federal government.

The U.S. Army Corps of Engineers has estimated the lake will draw three million visitors annually once the facilities are completed within three years. Hoffman has estimated the cost to the county of providing necessary services to that number of visitors will be $250,000 a year.

Last month the commissioners requested a meeting with Gov. Jim Martin to discuss the problem. But in a letter to the board, Martin said that because of a heavy schedule he had asked Thomas Rhodes, secretary of the N.C. Department of Natural Resources and Community Development, to look into the matter.

The board has also sought federal help from 6th District U.S. Rep. Bill Cobey. But Cobey has responded that the state, which will be taking the lake over from the Corps of Engineers by 1988, should provide the funds.

Cobey and the commissioners have suggested that fees charged by the state for use of the lake's recreation areas be directed to the county.

Hoffman told the board at its October meeting that the Corps had eliminated this year a $10,000 allocation paid for county services at the lake annually.

He also noted that the federal government was considering eliminating a $30,000 allocation per year paid to the county to offset the loss of $150,000 in property taxes.

"We have to keep pushing and keep the problem in the public's eye," Hoffman said.

In other action, the board:

• Considerd a request from the Orange Water and Sewer Authority for the commissioners' endorsement of a plan to upgrade University Lake and Cane Creek Reservoir watersheds to a more protected status. Several Chatham County creeks drain into these watersheds. The commissioners expressed concern that the new water classification, which prohibits municipal and industrial waste discharges into the water supply, might hinder industrial development in the area. They requested that a representative of the authority meet with them to discuss their concerns.

• Approved the purchase of eight new vehicles for the sheriff's department. Hoffman said $98,000 had been budgeted for the purchase, but that the vehicles would actually only cost $82,000

VII. DRCC Requests To The Subcommittee on Energy and Water Development.

A. That the committee request an explanation from the Chairman of the Randolph County Commissioners explaining the reversal of their position regarding the Randleman Dam as they had published it in a position paper. (Copy attached)

B. The the committee support Representative Bill Cobey's stated reservation that he will not give approval to the Randleman Dam until the amount of land acquisiton is substantially reduced.

In Letters To Officials

Board Spells Out Position On Dam

Editor's Note: The following is the text of a "Position Paper" stating the views of the Randolph County Commissioners on the proposed Randleman Dam project on Deep River. This is the text of letters sent to U. S. Senators Jesse Helms and John East and Gov. Jim Hunt. The author is Darrell Frye, chairman of the Randolph County Commissioners.

The Randolph County Board of Commissioners has authorized me as the Chairman of the Board to state again our position concerning the proposed Randleman Dam Project proposed by the U. S. Army Corps of Engineers.

We are opposed to this project. Our position is not based on a narrow constituentist view of Randolph County property or citizens. We base our position on the following factors: (1) a comprehensive long-range overview of the water needs of our region; (2) the problems of maintaining minimum water quality standards in Deep River; (3) the cost of the project to U. S. taxpayers and its effect on local tax rates; and (4) the preservation of valuable farm land vs. flood control benefits.

(1) The Board fully recognizes that Greensboro and Guilford County will need additional water sources by the turn of the century. We support and want to cooperate with our friends to the North in meeting those needs.

Deep River is, however, the least desirable water source available to meet those needs. As you are aware, its head waters are at the Regional Airport located West of Greensboro. This is an area of rapid commercial and industrial growth. The river flows through the High Point area where it is twice impounded for the High Point City reservoirs. One of those lakes is already showing serious signs of premature aging due to excessive non-point source run off.

The river continues its course through the Jamestown area, another area of rapid growth, entering Randolph County. With the opening of the new I-85, the northwest experience increased commercial and residential development in the decades ahead.

The entire watershed for this proposed lake is, therefore, located in a region that will experience accelerated industrial, commercial and residential growth in the years ahead. This growth will result in continued and increasing problems of pollution of the proposed lake.

This pollution will not be solved by the treatment of point source effluent and sewage. The greater problem will be non-point source run off of impervious surfaces, uncovered lands, fertilized acreage and industrial storage. This non-point source run off is difficult, if not impossible, to control without the most stringent land use restrictions. The necessary restrictions would not only be difficult to pass and implement, they would put a damper on development of any kind. Commercial and industrial growth is the key purpose of obtaining additional water sources. Wake County has excluded all industrial and commercial development within their watershed areas. Durham County is doing likewise by placing limitations on the amounts of impervious coverage allowed.

Land use restrictions, coupled with discharge limits and requirements for industrial treatment facilities, will make the watershed area much less desirable as an area for potential industrial and commercial sites. On the other hand, the failure to impose such restrictions will inevitably result in rendering the lake unusable as a long-term water source.

There are at present no restrictions which have been approved by Guilford County to protect the watershed. Chemical drums located at facilities in Guilford County have not been cleaned up. Any responsible plans to use the Randleman Lake as a water source require the preservation of the watershed as an absolute prerequisite to the construction of the lake.

In addition, studies show that the projected water needs of our region have been greatly overstated. Projected population growth for

(Continued from Page 1)

55%, water needs by 30%.

(2) The construction of this project on Deep River will require the building of a huge pipeline to carry the sewage discharged from the City of High Point around the lake to a point in the river just above the City of Randleman. The Corps of Engineers estimate that during low water periods, up to 50% of the water flow in Deep River below the dam will be from the sewage pipeline. Deep River is already a Class "C" stream, unfit as a water source or for use in fishing, boating or swimming activities. What will be the effect on the farms and towns downstream from this effluent outfall?

Common sense requires us to look ahead at least fifty years when preparing to invest millions of dollars in a water resource project. Doesn't it make more sense to build smaller reservoirs on the numerous cleaner water sources located in Randolph and Rockingham Counties to meet the projected water needs of the region?

The City of Durham has rejected both Falls of the Neuse and Jordan Lake as water sources. Instead they are building a second reservoir to provide water for their city. Their reason being to have a safer source of water than that provided by the two lakes.

The City of Asheboro and the Town of Ramseur have recently completed dams and reservoirs that will provide high quality water sources for their needs well into the next century. The region has numerous clean water sources for impoundment of water on the Dan, Mayo and Uwharrie Rivers, as well as on smaller tributaries. Interbasin transfer agreements could certainly be negotiated. Such reservoirs would not require the ever increasing cost of watershed protection, restrictions and cleanup to the extent necessary in the proposed Randleman Lake Project.

(3) Current projections indicate that 48 million dollars would be required for governments to participate in the construction and use of this project. The investment of this amount of local funds is sufficient to construct a variety of alternative impoundments without substantial federal participation. Projected local cost figures by the Corps of Engineers do not include the loss of 10,000 acres from the Randolph County tax rolls.

The cost to federal taxpayers is just as real a cost as local taxation. There is an understandable tendency to view federal funding as a gift that someone else is paying for. All of us, however, are shouldering the burden of excessive federal spending, and we believe that the onstruction of smaller reservoirs for water impoundment is a method of saving several tens of millions of federal tax dollars.

(4) The primary job of the Corps of Engineers in dam construction is flood control. The Corps states that the primary flood damage centers that will benefit from this project are the Towns of Randleman, Worthville, Cedar Falls, Franklinville, Ramseur and Coleridge. Price figures used by the Corps for the value of properties located within the standard project flood plain do not take into account the age and use of the properties included. Many of these properties are mills which are no longer in use at all. More importantly, no mention has been made of the annual cost of permanently flooding 10,000 acres of prime agricultural land.

Usable farm land is becoming a scarce resource throughout the United States. Farm land should be factored into any equation in determining our resource needs in the future. The proposed Randleman Dam and lake would flood some of the most productive cattle and dairy farming acreage in North Carolina. There should be a balance in evaluating our resource needs. The loss of valuable farm land should be included as part of the true cost of this project.

We are, of course, aware that this project has been in the planning stages off and on for a number of years. We understand the surface attraction of funding this project primarily from federal tax dollars. We know that interbasin transfer would present a problem. We have evaluated the potential benefits of this project as well as its cost in arriving at our position on this matter.

It is our opinion that the only justification for the construction of this project and the expenditure of the monies involved would be as a water source for the Piedmont Region. We submit to you that there are cheaper, more efficient and more effective methods of impounding cleaner water than this project. The other reasons given for its construction, including flood control and recreation, simply do not stand the test of rational analysis. Corps' projections simply ignore hidden costs of land use controls, loss of farm land and pollution cleanup affecting the ultimate cost to the taxpayer, both in local ad valorem taxes as well as federal tax dollars.

We hope you will again review your position on this project before final funding is approved. If we may be of any service or provide any information concerning this project, please do not hesitate to let us know.

Mr. BEVILL. Thank you very much. And tell Kemp we are sorry he couldn't make it, but you filled the bill mighty well.

Mr. DAVIS. I hope I haven't been a distributor of the flu.

Mr. MYERS. I think you had a prepared statement.

Mr. DAVIS. Yes. I handed it in.

Mr. BEVILL. This committee stands adjourned until 10:00 o'clock Monday.

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